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ORIGINAL ARTICLES.

THE MILK QUESTION AND TUBERCULOSIS.

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The Incidence of Bovine Tuberculosis.

There is little doubt that milk is responsible for the vast majority of cases of bovine tuberculosis which occur in man. The numbers of these may be measured from the notifications which are received by the medical officers of health, the numbers of deaths returned in the Registrar-General's reports, and laboratory experiments: these statistics enable us to distinguish between cases which are of human and those which are of bovine origin. The information which may be obtained from these sources shows that whereas the notifications of non-pulmonary tuberculosis in 1913 were 36,351, this number was reduced to 15,837 in 1922. On that date a more complete system of recording the incidence of tuberculosis was adopted, with the result that in 1923 the notifications numbered 20,216, and in 1929 18,682. It is important to note that, despite the fact that a more complete record is kept at the present time than was the case in 1913, the number of notifications of non-pulmonary tuberculosis has dropped by about 50 per cent. during the last eighteen years—that is to say, from 36,000 to 18,000, of which about 4,000 are probably due to the bovine type of the disease.[1]

What is true of the incidence is equally true of the death-rate. The number of these has been calculated by different workers who did not all adopt the same statistical method. There is, therefore, reason to believe that their conclusions are reasonably accurate, and the result of their work demonstrates that deaths from tuberculosis of bovine origin have fallen from about 3,500 in 1918 to 2,000 in 1927.[2] There is,

therefore, a material fall both in the incidence of this type of disease and in the death-rate which it causes.

The reasons for the lowering of these different rates are not very clear. They are sometimes attributed to one cause and sometimes to another. For example, it is probable that the amount of tuberculosis in cattle has diminished, since there is no doubt that they are much better kept and better fed than they were twenty-five years ago, when one of my colleagues and I examined 100 samples of milk from a localized area in Great Britain which was not subject to adequate public health control and, so far as I know, had no system of agricultural education. The samples were all mixed milk, purchased in the ordinary way at different farms and without any effort to investigate the condition of the cows, etc., and it was found that 25 per cent. of them were infected with tuberculosis. At the present time, I suppose, the average is about 8 per cent., and it is doubtful if it would be possible to find such a percentage as we obtained in any area in Great Britain. The fall has also been attributed to the increasing use of dried and pasteurized milk for the feeding of infants, and doubtless these have had their share, although it must be remembered that the pasteurization of milk according to the official standards is quite a recent innovation, and is only in use in a limited number of places. It seems probable also that the improvement in the standard of wages and improved nutrition have had their share in the result that has been obtained.

Those of us who have had contact with cases of this character know well the amount of invalidity and pain that they cause and, therefore, are anxious to see this source of tuberculous infection eliminated. The question, therefore, arises as to how this can best be done. The simple way out is to insist upon efficient pasteurization, although this is a much more difficult process than many people who recommend it realize, and, in fact, it has never reached country districts or the smaller towns in those countries which have adopted it. It is a valuable remedy, but presents one very great danger in that hitherto it has always tended to minimize the interest in the production of fresh milk which is free from disease. In the light of our modern knowledge of nutrition it seems to me that it is very important that we in this country shall endeavour to create a sufficient supply of satisfactory fresh milk to meet the needs of our people, and it is this aspect of the milk problem with which I should like to deal. It may be considered from different points of view.

The Nutritional Value of Different Types of Milk.

At least five big experiments have now been carried out in Great Britain in which milk has been added to the diets of children of school age.[3, 4, 5, 6, 7] All these experiments have shown that milk, even

separated milk, has very valuable nutritional qualities. The majority of them, however, gave no information concerning the relative nutritional values of different types of milk. An attempt to fill this gap was made in the Lanarkshire experiment in which 5,000 children were given ¾ pint of Grade "A" (Tuberculin Tested) milk daily, a further 5,000 received the same quantity of the same milk after it had been pasteurized in accordance with the regulations of the Ministry of Health, and 10,000 children acted as controls. The ages of the children ranged from five to eleven years, and all of them were receiving their normal home diets. The experiment lasted for about four months, and a report upon it was issued by Gerald Leighton and Peter MacKinlay.[7] In their conclusions they state that "the addition of milk to the diet of school children is reflected in a definite increase in the rate of growth both in height and weight." They add that "in so far as the conditions of this investigation are concerned the effects of raw and pasteurized milk on growth in weight and height are, so far as we can judge, equal."

S. Bartlett[8] was unable to satisfy himself that this reading of the results was justified by the tables which were contained in the report (Table I.). On examining this table he noticed that "if the weight increase on raw and pasteurized milk in the six groups be compared, it is found that one shows a very small advantage in favour of pasteurized milk and the remaining five show advantages varying from 0·36 to 2·51 ounces in favour of raw milk." Moreover, the figures were liable to at least two sources of error—namely, variations in the home conditions and the limited numbers of children in the respective groups. S. Bartlett, therefore, divided the children into three groups, thus increasing the number in each group (Table II.). From the figures he thus obtained he drew the following conclusions: "When all the children on one type of milk are grouped together, the advantage of raw milk for growth in weight becomes $0{\cdot}86 \pm 0{\cdot}42$. The cautious statistician might say that this is not a significant result, but he would admit that the chances are about five to one that raw milk is better.

"The relative increases in height are invariably in favour of the raw milk, and in many of the age and sex groups the advantage is significant. When all the children are grouped together, the advantage of raw milk becomes $0{\cdot}035 \pm 0{\cdot}006$—*i.e.*, the difference is nearly six times the probable error, which is undoubtedly significant."

Later R. A. Fisher and S. Bartlett published a letter in *Nature* on these experiments and stated that in their opinion the evidence indicated that the children who had received the raw milk benefited much more than those who had received the pasteurized milk.[9] They add that "these results are put on record to avoid the danger that, on a superficial examination of the report, the conclusion should be drawn

that this extensive experiment demonstrates the equivalence of pasteurized and raw milk. In reality the reverse is the case; and the very marked difference in response to two materials which in their gross nutritional contents are so closely equivalent raises a problem of very great interest, which can probably only be cleared up by more deliberate experimentation."

The authors' tables (Tables III. and IV.) indicate that the boys obtained greater relative benefit from the raw milk than the girls. This result is of interest, since it corresponds with the experience of E. C. V. Mattick and J. Golding in the experiments which they are conducting upon the relative nutritional values of raw, pasteurized and sterilized milk for the feeding of rats.[10] In these experiments also the favourable effects of feeding raw milk were much more immediately shown by the bucks than by the does. If Fisher and Bartlett's conclusions are at all correct, it is clear that they are right in their suggestion that further work upon this subject is urgently required. Its need is also demonstrated by the work of Daniels and Stearns;[11] Ladd, Evarts and Franks;[12] and Lewis[13] in America. These workers have studied the relative nutritional values of raw, quickly boiled, and pasteurized milk in the feeding of infants up to one year of age. Their conclusions are that freshly boiled milk has a greater nutritional value than pasteurized, and Ladd, Evarts and Franks, who alone of the three groups of workers fed raw milk, have found that it was better than pasteurized, even when cod-liver oil and orange juice had been added to the latter.

Evidence of Under-Nutrition.

Evidence is also accumulating which tends to show that we have not yet attained to the highest standard of physical fitness. That this is probably true may be brought out in several ways. The Chief Medical Officer of the Board of Education in his Annual Report for the year 1929 says:[14] "In my report for 1927 I stated that there is evidence to show that there is a large amount of 'subnormality' amongst secondary school children, not severe enough to be labelled malnutrition, but which, judged in relation to the period of the child's life and the heavy and competitive strain of the secondary school curriculum, may lead to serious conditions of ill-health." The recent experiments in which milk has been added to the diets of school children indicate that his statement is correct, since in every instance marked improvement in the condition of the children occurred, even though in some cases the experiments did not last for more than three or four months. It is obvious that such marked results could not have been obtained if the normal diets of these children had been sufficiently good to ensure really adequate nutrition for growth and

health. More accurate information on this subject has recently been obtained by Orr and Clark, who investigated the diets of 607 families in Scotland and found that "the great majority were incapable of supporting the optimum rate of growth."[15] There appears, then, to be a constantly increasing volume of evidence which shows that we have much yet to learn concerning the best ways of feeding our people, and it seems important that we should realize this fact, especially when we remember that adequate nutrition appears to have a great influence upon the incidence of disease.

Nutrition and Disease.

It has long been known that wars and famines are accompanied by epidemics of disease, and a great increase of diseases like tuberculosis. It is only comparatively recently, however, that we have begun to realize the very real relationship that probably exists between nutrition and disease in our daily lives. This may be illustrated by the consideration of some recent work.

McCarrison,[16] for example, tells us that during the past two and a quarter years he has made 1,189 post-mortem examinations of his stock rats, and has found that "disease and death have been excluded, almost completely, by minute attention to three environmental conditions: cleanliness, comfort, and food." The conditions under which the experimental animals live are identical with those for the stock rats, except that "they live in separate cages—as do the controls for each experiment—isolated from their fellows; they are thus less contented than their more fortunate kith and kin in the stock-animal rooms, and they are more exposed to the effects of chill, since they cannot be given straw bedding, though each evening they are given bedding of clean cotton-waste. The main regard in which they differ from the stock animals is in their food; it is always faulty in some way or another. Further, as my business is to learn, as far as I can, how the foods eaten by the people of India are related to disease, synthetic diets are used comparatively rarely and then only for special purposes. The materials entering into the various faulty dietaries are usually those in use by the people of India; sometimes actual Indian dietaries are used."

During the past two and a quarter years R. McCarrison has also carried out more than 2,000 post-mortem examinations upon the rats fed upon these foodstuffs, and has found among them many and various types of disease. He further tells us that all the other animals which he keeps have shown similar results—namely, that "properly fed animals remain remarkably free from disease; improperly fed animals are remarkably subject to it. It is reasonable, therefore, to assume

that the human species is no exception to this rule, and that many of the ailments to which man is erroneously supposed to be heir are the outcome of his improper feeding."

Orr, Macleod and Mackie[17] have also drawn attention to the same subject in the work which they have carried out upon the nutrition of sheep. They state that "an attempt was made to collect information with regard to the mortality of sheep in districts with pasture of different nutritive value. It was found difficult to get reliable data. Such information as could be obtained showed that mortality was higher on poor hill grazings where the pastures had an abnormally low content of inorganic salts, especially calcium, and probably, of course, with deficiencies in other respects. It was recognized that there are other factors affecting mortality besides the probable influence of the amount and composition of the food."

Further experiments during the years 1926-28, in which supplements were given of substances which were thought to be deficient in the pastures, "seemed to indicate that in areas where mortality was high, improved nutrition accompanied decrease in mortality following the supplementary feeding." The authors also point out that similar results have been obtained from a study of the diets of different East African tribes.

All of us know well the work of Mrs. Mellanby on the relationship between diet and dental caries.[18] In her report she tells us that the experimental results show "that it is now possible to produce at will any degree of dental structure, from the most perfect to the most imperfect, mainly by regulating the diet." Later on she says "that the character of the defects in the deciduous teeth probably depend largely upon the amount of the vitamin stored in the mother's tissues before pregnancy and the amount present in the diet during pregnancy and lactation. The maternal food also affects the future structure of the permanent teeth when the mother's diet contains abundant vitamin D, and when the offspring after weaning are fed on a diet deficient in this substance, the permanent teeth, although defective in structure, are not nearly so defective as is the case when the mother's diet has also been deficient in the vitamin. In other words, a deficiency in the mother's diet during pregnancy may influence the offspring throughout its life."

My object in drawing attention to the probable importance of nutrition in the prevention of disease is due to the fact that I feel that insufficient attention has been given to it up to the present time, and am inclined to imagine that any deficiencies which may occur can readily be replaced. Those who are investigating nutrition are coming more and more to the conclusion that you cannot treat a foodstuff such as milk without altering it in many different ways, of some of which we possess a certain amount of knowledge, but of many our knowledge

has still to be sought. Moreover, it is not possible to replace readily the substances which have been altered. Modern research has also demonstrated the very close relationship that probably exists between under-nutrition and disease.

In the past stress has been laid upon the treatment of disease and its prevention by improved housing conditions, etc., and when the problem of nutrition has been considered at all it has been assumed that our knowledge is sufficient to enable us to make up satisfactory diets. The question arises whether we ought not to reconsider our position in view of the fact that it is now possible to obtain milk, for example, from herds which do not react to the tuberculin test for the feeding of our children. In some areas such milk is now being utilized for the feeding of infants on a considerable scale, and in at least one such area it has been found that this method of feeding has coincided with a material fall in the incidence of infection by the bovine type of tuberculosis. It does appear that we ought not to forget the words of Sir Leslie Mackenzie[5] (quoted by Leighton and Clark): "In 1903, when the Royal Commission on Physical Training (Scotland) issued their report, two things became clear: first, that medical examination and superintendence were essential conditions of any system of physical education; second, that in the end *the fundamental problem is one of nutrition.* . . . Whenever a preventable ailment is prevented and every serious disease treated to its finish, the new battalions of children coming forward have to be superintended from the nutritional standpoint."

TABLE I.: INDICATING DIFFERENCES OF CHANGES OF WEIGHT AND HEIGHT IN RAW AND PASTEURIZED MILK-FED GROUPS.*

(From Lanarkshire Report by G. Leighton and P. MacKinlay.)

Age.	*Weight.*		*Height.*	
	Boys.	*Girls.*	*Boys.*	*Girls.*
5	−0·77±3·19	7·88±4·02	0·01±0·075	−0·23±0·055
6	3·55±0·94	0·56±0·94	0·00±0·018	0·02±0·015
7	−0·70±1·08	−1·72±1·04	0·05±0·019	0·03±0·019
8	−1·00±1·00	0·03±1·00	0·03±0·018	0·03±0·017
9	1·60±0·98	1·29±1·12	0·06±0·017	−0·02±0·016
10	3·14±1·24	−3·88±1·28	0·08±0·019	0·07±0·018
11	1·69±1·44	7·84±1·68	0·04±0·021	0·05±0·026

* A negative sign indicates a difference in favour of the pasteurized milk-fed group.

TABLE II.: INDICATING DIFFERENCES OF CHANGES IN WEIGHT AND HEIGHT IN RAW AND PASTEURIZED MILK-FED GROUPS.

(Recalculated by S. Bartlett to increase the numbers of children in each group.)

Age.	*Boys.*	*Girls.*	*Boys and Girls.*
	WEIGHT.		
5, 6 and 7	1·31±1·03	* −0·39±1·02	0·46±0 73
8 and 9	0·36±0·97	0·66±0·95	0·51±0·68
10 and 11	2·51±1·21	1·04±1·12	1·79±0·79
Total of all ages	1·30±0·60	0·42±0·59	0·86±0·42
	HEIGHT.		
5, 6 and 7	0·025±0·016	0·019±0·016	0·022±0·011
8 and 9	0·046±0·015	0·005±0·014	0·025±0·010
10 and 11	0·063±0·017	0·062±0·017	0·062±0·012
Total of all ages	0·044±0·009	0·026±0·009	0·035±0·006

* This negative sign indicates a difference in favour of pasteurized milk; in all other groups the difference is in favour of raw milk.

TABLE III.: INDICATING AVERAGE INCREASES IN WEIGHT IN OUNCES.

(Bartlett and Fisher.)

	Boys.			*Girls.*		
	Control.	*Raw Milk.*	*Pasteurized.*	*Control.*	*Raw Milk.*	*Pasteurized.*
Increase	10·041	13·780	12·507	9·755	14·315	13·907
Excess over control ...	—	3·739	2·466	—	4·560	4·152
Value per cent. ...	—	100·0	66·0	—	100·0	91·1

TABLE IV.: INDICATING AVERAGE INCREASES IN HEIGHT IN INCHES.

(Bartlett and Fisher.)

	Boys.			*Girls.*		
	Control.	*Raw Milk.*	*Pasteurized.*	*Control.*	*Raw Milk.*	*Pasteurized.*
Increase	0·7274	0·8145	0·7707	0·7300	0·8140	0·7889
Excess over control ...	—	0·0871	0·0433	—	0·0840	0·0589
Value per cent. ..	—	100·0	49·8	—	100·0	70·1

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THE NEED FOR THE REORGANIZATION OF THE TUBERCULOSIS DISPENSARY.

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ON the kind invitation of the Editor I propose to deal with a subject which has for long demanded the attention of all interested in tuberculosis and chest diseases in relation to the public health.

The tuberculosis dispensary system was introduced into this country by that great pioneer, Sir Robert Philip of Edinburgh, who began the first anti-tuberculosis dispensary some forty years ago. The dispensary is now an established unit in all anti-tuberculosis schemes. At present

there are well over 400 such dispensaries at work throughout the British Isles, and nowadays most areas enjoy the benefit of a well-organized public health department, which includes a tuberculosis dispensary, staffed by a specialist physician and nurses. The physician is expected to be of consultant rank, with a good knowledge of general medicine and a specialized knowledge of pulmonary diseases generally and pulmonary tuberculosis in particular. As I have already ventured to point out elsewhere, the services which a tuberculosis dispensary can and should render to a busy general practitioner are invaluable, although one must frankly admit, as a result of close and intimate discussions on the subject with general practitioners, the dispensary might with advantage be subjected to certain readjustments which would be of mutual benefit to patients, practitioners, and tuberculosis experts alike and, moreover, prove a gain to public health. It is these readjustments which I propose to discuss.

It is questionable whether the tuberculosis dispensary as it exists today, in view of the recent advances in our knowledge of pulmonary diseases, is proving as useful to the general practitioner as we could wish. It is doubtful, too, whether the functions of such a dispensary are adequately known to the general practitioner. It is not the purpose of a dispensary to give medicinal treatment to patients or to interfere in any way with the general practitioner. In this connection the term "dispensary" is most unfortunate, as the tuberculosis dispensary is essentially a consultation centre for the aid of the general practitioner.

The Departmental Committee of the Ministry of Health have given the following as the functions of a tuberculosis dispensary: (1) A centre for diagnosis; (2) a centre for observation cases; (3) a centre for after-care (that is, following sanatorium treatment); (4) a centre for special treatment and supervision of cases; (5) a centre for the examination of contacts; (6) an information bureau and educational centre.

These functions are essentially of a preventive nature, and can only be carried out to the full if the tuberculosis physician, the general practitioner, and, through the latter, the patient enter loyally into a close system of co-operation.

Tuberculosis Dispensaries and Clinics for Diseases of the Chest.

Pulmonary tuberculosis, with its varied modes of onset and symptomatology, may simulate, at one time or another, almost any disease in general medicine. If full use is made of all the clinical material at the chest clinics, a practical working knowledge of tuberculosis may be obtained both by medical students and practitioners, whilst, at the same time, all other varieties of mischief in the lung will be seen. By thus

training the medical student, the practitioner of the future, in chest diseases the early diagnosis and early and efficient treatment of pulmonary tuberculosis will be more common, and knowledge of its prevention more adequate. Furthermore, through early and correct diagnosis, tuberculosis, a preventable disease, will be adequately attacked, both from the lay and medical sides, with the very real hope that it may be abolished from our midst.

Experience shows that at most properly equipped dispensaries at least 50 per cent. of new cases which are sent for diagnosis at each session, after careful systematic routine clinical and radiological examinations of the chest and bacterial examinations of the sputum, prove to be either free from disease or suffering from some other form of pulmonary or extra-pulmonary mischief. Many of these cases are due to a lesion in the upper respiratory tract, producing secondary pulmonary congestive changes, closely simulating pulmonary tuberculosis. Of the pulmonary lesions not due to tuberculosis encountered at a tuberculosis dispensary may be mentioned "apical catarrhs," bronchitis, bronchiectasis, pulmonary fibrosis, cancer of the lung, the pneumokonioses and mycoses, as well as many extra-pulmonary lesions, such as heart disease, especially mitral stenosis with associated pulmonary stasis, and syphilis of the heart and aortic stem, thyrotoxicosis, blood diseases, and gastro-duodenal ulceration, etc. In former years, when certain modern methods of diagnosis (for example, X ray) were not available, many of these cases were considered tuberculous. Nowadays, diagnosis has become more accurate, with the result that statistics on the incidence of pulmonary tuberculosis are becoming more and more reliable.

The natural result of the large variety of pulmonary and extra-pulmonary diseases seen at a so-called tuberculosis dispensary, the recollection of fear and dread which the word "tuberculosis" excites in the minds of many laymen, leads one to ask, Is the title "tuberculosis dispensary" as a centre for the early diagnosis and prevention of the disease an ideal one to encourage practitioners and patients alike to make the fullest use of it?

Many general practitioners have informed me that the average patient dreads nothing more than the idea that he must attend a tuberculosis dispensary. A few patients, after tactful explanation, will quickly reconcile themselves to the idea. Others, less intelligent, fear the worst; they suspect the doctor considers them victims of consumption—to them, a leper-like condition—and from the moment of entry to the dispensary, should they consent to go there, they are, as a general rule, a mass of "nerves," enduring anxiety and restless nights until the diagnosis is made for good or for bad. How can such an impression and atmosphere encourage preventive work to the full? Nor,

indeed, can it be said to have encouraged the practitioner's co-operation, who, quite naturally, is duty bound to consider the feelings of his patients.

There is no doubt that if the anti-tuberculosis campaign is to succeed in its fullest measure, the complete co-operation of the general practitioner must be secured. It will not be secured by a few kindly words addressed to sundry public organizations. His self-respect and responsibilities must be considered if his co-operation is to be obtained, and his advice must also be obtained and acted upon. Moreover, he must be given a definite place in the anti-tuberculosis scheme; he is the pillar upon which the success of every anti-tuberculosis measure rests; he must receive adequate training, which he certainly did not get as a medical student, in the early diagnosis of pulmonary tuberculosis. Local public health bodies should encourage practitioners to attend and make the fullest use of the tuberculosis dispensary, act on after-care committees, and, if necessary, even take up a definite position in local departments, always having at his side the expert opinion of the tuberculosis physician.

The general practitioner's position, however, is not infrequently a difficult one. If his complete co-operation is not obtained there may perhaps be a little justification. For reasons so often put to me by general practitioners, many ill-informed patients will resent the doctor's injunction to go to the tuberculosis dispensary for whatever purpose, and will often, despite tactful explanations, consider his advice even impertinent and will never attend his surgery again. What is the result? For having given such sound advice the general practitioner loses the patient and the same patient perhaps continues with his symptoms without consulting any doctor. Finally, from sheer necessity, when another doctor is seen, the patient is probably suffering from advanced pulmonary tuberculosis and may have infected the rest of his family.

There can be no doubt that were "clinics for diseases of the chest" or special tuberculosis departments[1] of general hospitals to replace "tuberculosis dispensaries," such problems would not arise to the same extent. I have tried to show that some such title as "chest clinic" is the more appropriate, since many of the cases admitted there are found to have some other pulmonary or extra-pulmonary disease. At my clinic, of the large number of new cases seen each week, at least 50 per cent. are non-tuberculous. The sooner, therefore, the unfortunate title of "tuberculosis dispensary" is dropped, the brighter will become the prospects of real prevention and the fuller will be the necessary co-operation of both the general practitioner and the patient,

[1] The Tuberculosis Department at St. Thomas's Hospital is an excellent illustration of this point.

and, even more important, the earlier will all suspected cases of pulmonary tuberculosis be diagnosed.

At my own clinic, through the co-operation of the Medical Officer of Health, Dr. W. Benton, and the Public Health Committee, the "chest clinic" principle now functions most satisfactorily in the Borough of East Ham.

Chest Clinics as Centres for the Teaching of Pulmonary Diseases.

It has been truly said that adequate education of the layman must go hand in hand with the adequate education of medical students and practitioners. The education of medical students in the early diagnosis of pulmonary tuberculosis is deplorably deficient, at any rate, in England. It will be generally admitted that the medical student receives little practical training in tuberculosis for the simple reason that in teaching hospitals tuberculous cases are not admitted, and if by chance they are admitted, they do not remain for long, but are quickly referred to our tuberculosis dispensaries or sanatoria. The result is that few students, as I am repeatedly told by them during their medical training, ever see a case of pulmonary tuberculosis. How, then, can the young practitioner ever be expected to assist in the early diagnosis of the disease?

There is urgent need for close co-operation between the teaching hospitals, the tuberculosis dispensaries, and sanatoria, in all of which an abundance of material can be made use of. It is of interest to note that in the report of the Departmental Committee on Tuberculosis, issued as far back as 1912, a special reference was made to tuberculosis and medical education. The Committee were then of opinion that additional facilities should be afforded to medical students and practitioners to acquire familiarity with the methods of diagnosis of tuberculosis, more especially in its earlier manifestations, and with the methods of treatment. Among the recommendations, the two following are of special interest, remembering they were made as far back as 1912: (1) Medical students and practitioners should be afforded facilities to attend at tuberculosis dispensaries and sanatoria; (2) it is advisable that tuberculosis dispensaries should, where possible, be directly associated with schools of medicine.

As has already been stated, despite these recommendations, medical training in pulmonary tuberculosis is deplorably bad in this country, and, with few exceptions, there is little co-operation between the teaching hospitals and tuberculosis dispensaries. In 1927, Sir George Newman, in his special report to the Education Committee of the General Medical Council, states: "The difficulties in arranging for the clinical study of tuberculosis are more serious, as under the tuberculosis

schemes of the local authorities cases of notified tuberculosis are referred to the official dispensaries and sanatoria." Sir George Newman recommends co-operative organization for the purpose of teaching between the general hospitals, the tuberculosis dispensaries, and sanatoria. The machinery exists and merely requires to be set in motion. Such, however, are the unfortunate conditions prevailing today that they must, indirectly, be held responsible for the fact that tuberculosis is still the greatest scourge of mankind, and in England and Wales alone some 70,000 cases are notified yearly. It requires little imagination to appreciate the fact that every student should, in the course of his training, receive adequate instruction in the diagnosis, prevention, and treatment of tuberculosis.

At the Universities of Edinburgh and Glasgow, however, a course in tuberculosis is compulsory for every medical student.[1] In Edinburgh the tuberculosis dispensary functions as a training centre for this disease, and thus medical students obtain a practical knowledge, not only of tuberculosis, but of chest diseases generally. Whilst, however, this co-operation between the general hospitals and the tuberculosis dispensaries, and even the sanatoria, may exist in Edinburgh, it exists in few other areas, and, as has been pointed out, there are over 400 dispensaries at work in the British Isles. The result is that the training in so vital a subject as tuberculosis is grossly inadequate, and medical students—90 per cent. of whom will be the general practitioners of the future—have no adequate opportunities of studying tuberculosis at its very onset. These enter the important sphere of general practice with little or no knowledge regarding the manifestations and treatment of this widespread disease.

Dare one hope that something practical may result in the near future so that students and practitioners may take advantage of the wonderful material which exists? The teaching authorities at the medical schools must begin to confer with the medical officers of health in the local areas and co-operate with them in devising suitable arrangements, as is done in the case of infectious fevers.

A recent visit to Frankfort, where the Royal Institute of Public Health held its 1931 meeting, showed conclusively that pulmonary tuberculosis is not there divorced from general medicine. Professor Volhard, the Professor of Medicine at Frankfort, is in charge of the tuberculosis department of the city, which is intimately connected with the other departments of the medical clinic.

The Equipment of a "Chest Clinic."

In order, however, to maintain a correct standard of diagnosis, the tuberculosis physician has a right to expect that the local authority

[1] I am told that more recently a course in tuberculosis is being made compulsory at one or two other medical schools.

will render him every possible assistance, in so far as equipment is concerned, to enable him to carry out his work in a competent manner. Hence a dispensary organization should, as the Ministry of Health directs, be linked up with (*a*) a pathological laboratory, (*b*) an X-ray department and (*c*) consultative experts. The latter should specially include a dental surgeon, ear, nose and throat surgeon, and a chest surgeon. Such team-work between physician and surgeons is vital. Finally, observation beds in connection with the local hospital, be it municipal or voluntary, for difficult cases are an absolute necessity, and the tuberculosis physician should have complete charge of these beds. In other words, he should be a visiting physician to the hospital.

One may say, therefore, that the prevention of tuberculosis depends essentially on four important factors: (1) The tuberculosis dispensary controlled by the local authorities' public health organization and fully equipped and staffed efficiently; (2) the part played by the general practitioner; (3) the education of the layman in the principles of hygiene; (4) the education of the medical student, and therefore the general practitioner, in tuberculosis.

In reviewing these factors, one may justifiably ask, Can any of them be subjected to any change or readjustment which may in the future help reduce both the incidence and the mortality rates of a preventable disease? I have endeavoured to show that they can. Public education has, in my opinion, received the greatest amount of attention, probably at the expense of the other factors. The "tuberculosis dispensary" can, and should be, of the greatest service, but I am convinced that in the interests of patients, practitioners, and the public health alike there is great need for the reorganization and readjustment of the tuberculosis dispensaries as they exist at the present time.

General Conclusions.

The need for the reorganization of the tuberculosis dispensary is suggested in the following ways:

1. The title "tuberculosis dispensary" should be replaced by the designation "the chest clinic," or be constituted a special department of a general and, if possible, a teaching hospital, as already exists in a few instances.

2. Adequate equipment, including observation beds at the local voluntary or municipal hospital (over which the tuberculosis physician is in charge), to carry on the work successfully in the light of the recent advances in our knowledge of the disease is suggested.

3. Full use of "chest clinics" as teaching centres for pulmonary disease should be made.

4. Fuller co-operation between the teaching authorities at the medical schools and local medical officers of health is vital in the

interests of the adequate training of medical students in pulmonary diseases generally and pulmonary tuberculosis in particular.

5. The general practitioner must be given greater facilities to acquire a knowledge of pulmonary tuberculosis at the existing "tuberculosis dispensaries," and he must occupy a more prominent position in anti-tuberculosis schemes.

THE PLACE OF THE TUBERCULOSIS COLONY IN A COMPLETE TUBERCULOSIS SCHEME.

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The usual Tuberculosis Scheme in force in most local areas in this country deals with the following:

(1) Diagnosis—in the home and at the Dispensary. (2) Treatment—in the home under Dispensary supervision and in Sanatoria and Hospitals. (3) After-Care—in the home with Dispensary supervision and, finally, Public Health measures for the prevention of spread of the disease.

Considerable success has rewarded the efforts of Local Authorities in all these branches of activity except in that of After-Care. The long list of patients breaking down again after returning to the ordinary economic conditions of life is a blot on the whole of our tuberculosis campaign.

How can the Tuberculosis Colony fit into such a scheme and be of practical benefit? Many workers are not altogether clear as to the composition of a Tuberculosis Colony and therefore overlook its utility in certain directions. A Tuberculosis Colony should consist of: (*a*) a Sanatorium; (*b*) an Industrial Department; and (*c*) a Settlement.

The Sanatorium of a Colony.

The Sanatorium should contain, besides sanatorium beds, a certain percentage of hospital beds, and it can with advantage take a certain number of mixed pulmonary and surgical cases. In such an institution patients can be given prolonged treatment.

A certain number of patients may be early cases and improve so much as to be able to be returned to their original work and home surroundings, if these be considered suitable. Other patients may improve sufficiently to take up their residence in the Settlement and engage in work in the Industries Department earning wages. Others may

need continued and active treatment for an indefinite period in the Sanatorium.

The institution, being part of the Colony and adjacent to the Settlement and Industries Department, is available for the instant application of rigid sanatorium treatment for any settler who shows signs of waning health. Such rigid treatment for quite a short period—a fortnight to a month—will often restore the powers of resistance of a settler and prevent a more serious breakdown.

The Sanatorium of a Colony therefore helps in the general scheme for the treatment of tuberculous patients and is of particular value, because it can give immediate short periods of intensive treatment to the flagging worker and rapidly renders him fit to return to the job which is kept open for him.

The Industries Department of a Colony.

A department devoted to the conduct of industries provides interesting graduated labour for sanatorium patients as part of their treatment. If several industries are carried on they will demand a variety of necessary operations, many differing from others in the amount of physical energy needed. The industries will provide employment for settlers who will be working a limited number of hours according to their physical ability and under the best hygienic conditions.

Such an organization will overcome the economic difficulties with which the medium case is met in the outside world and which are the cause of the lamentable number of breakdowns under most Tuberculosis Schemes. The security of tenure of his job reacts enormously towards the well-being of settlers employed in a Colony.

The Settlement of a Colony.

The Settlement provides cottages for married settlers, and one or more hostels or boarding-houses for single settlers, all working for wages in the Industries Department. The chief value of a Colony is by virtue of its Settlement, which is the only really common-sense method of dealing with certain types of case. The constant medical supervision of the man and his family in his home and work are of inestimable value in the prevention of breakdowns.

The Settlement must be regarded as an asset from the preventive side in a Tuberculosis Scheme. The Settlement Section of a Colony is not a dump for the advanced case who is too sick to work at all and requires active treatment—such a case will always need institutional treatment and will not enter the Settlement—neither is it the place for a recovered man who has suitable light work and good surroundings to return to. Such a man, however, will become suitable for settlement should he show signs of being unable to hold his own in the old

environment. A man can be tested for one or more years in a Settlement and, if found fit enough, can be returned to his former home and work.

General Conclusions.

In the light of the above advantages provided by the Colony Scheme surely it is one upon which it is worth while expending some money. Opponents of Colony Schemes emphasize the loss on the industrial side, the cost of housing, and the fact that only a certain proportion of cases benefit under such a scheme. With regard to the last objection, it is shown above that the Colony Scheme, which includes a Sanatorium, can provide for all classes of case as under other schemes; moreover, it can show a definite advance in the methods of after-care of the medium case.

Industries carried on by partly disabled men must, of necessity, suffer loss; but this is not as large as is often suggested, provided the scheme has developed sufficiently to ensure a large turnover and a standardization of work on the repetition principle. Such loss is a small price to pay for the obvious benefits of healthy conditions, prolonged life, and contentment conferred on the disabled men who soon and repeatedly break down under the present methods of after-care. One has only to have had experience of work in a Tuberculosis Colony to be struck by the extraordinary powers of resistance of settlers to their disease when working under the special conditions which remove the ever-present and unnerving fear of loss of work which meets them in the outside world. The healthiness of the settlers' children is an outstanding feature of such Settlements as those at Papworth, Preston Hall, and Barrowmore. The question of housing is a difficult one owing to the need of capital for their provision, and the success of a Settlement turns on this point. The housing difficulty is, however, not peculiar to Tuberculosis Settlements.

Local Authorities might well remember that every house provided in a Settlement is the saving of two houses in the district from which the settler came; the patient has no longer to be housed by the Local Authority, and the latter has a vacant house waiting for another tenant; moreover, a possible source of danger is removed from that area. Yet Local Authorities have done nothing so far to help such Settlements as have come to their aid in this way. Some of the large sums of money expended on Tuberculosis Schemes by Local Authorities might be allocated with advantage to paying something towards the settlement of some of their tuberculous population in recognized Settlements.

REFLECTIONS ON THE FUNCTIONS OF TUBERCULOSIS CARE COMMITTEES.

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The work of Tuberculosis Care Committees has been frequently described—*e.g.*, by Jessel[1]—but, as a preliminary to these reflections, it is desirable to summarize their main activities. The Rotherham Committee, with which the writer is actively associated, acts mainly in the following directions: (*a*) Efforts to obtain suitable employment for fit patients. These schemes include the employment of chosen patients as car watchers at the car parks which have been opened by the Committee; they also include schemes of co-operation between the Committee, the local Labour Exchange, and the heads of local commercial enterprises. (*b*) Assistance in obtaining suitable dwellings. (*c*) The granting of extra nourishment to necessitous cases who are not otherwise provided for. (*d*) The provision of clothing to suitable patients, especially those who are about to enter the sanatorium. (*e*) Assistance in the provision of such articles as surgical splints, artificial teeth, etc. It will be noticed that the assistance under the headings (*c*), (*d*), and (*e*) involves only the expenditure of money on the articles in question, and this type of assistance is therefore within the power of any Committee which has the necessary funds.

There does not appear to be any doubt but that the granting of clothing, surgical requisites, etc., does materially help the individual patients. Assistance in providing artificial teeth is even more necessary, and the cost of these essentials of good health is probably the only reason why this form of assistance is not further developed in different areas.

The granting of extra nourishment is one of the most easily performed functions of a committee, and it is certainly the one of which advantage is most widely taken. Yet the case here is by no means so clear. In the Circular[2] in which the Ministry of Health authorized a grant for these purposes, it was emphasized that the classes of patients who were likely to benefit therefrom were: (1) Patients who had received sanatorium treatment, and who were expected shortly to recover full working capacity; and (2) patients who were awaiting admission to a sanatorium, and in whom ultimate arrest was to be expected. No one will deny that these cases, if any, are likely to be benefited by additional nourishment. Yet, despite every care, chronic

cases creep into the list of recipients, which has to be reviewed periodically. Considering the relatively small number of patients who can strictly be expected to derive benefit from additional nourishment, the writer is of the opinion that this type of assistance is not a success, and probably does little to combat the disease, either in the individual case or in the tuberculous community as a whole.

The types of assistance which are classified under headings (*a*) and (*b*) in the scheme—*i.e.*, efforts to obtain suitable employment and suitable houses for patients—differ markedly from those already considered in that the financial condition of the Committee is no criterion of its probable success in these directions. Yet it is on this success that the work of the Committee must ultimately be judged. How many Committees can say that they are making, on these lines, progress which they themselves consider to be satisfactory?

The housing question would offer the easier solution were it not for the fact that the two problems are inextricably interrelated. The great progress in housing which has recently been made by local authorities has created many houses which could be occupied by tuberculous families. But these authorities have facilities for examining the financial conditions of applicants for their houses, and it is perhaps not unnatural that they should refuse to rent a house to a family which is in debt. Unfortunately, most of those who require the assistance of the Care Committee fall into this latter category, and the Committee, being a voluntary body, can do little to overcome the scruples of the local authority. In some areas certain houses have been set aside for tuberculous patients, but these areas are relatively few.

The solution of the unemployment problem is, then, the crux of the matter. If a patient is able to obtain employment, then he will be able to afford a decent house and sufficient food for himself and his family. But the progress which has been made towards this solution is so slight as to be almost negligible. Those patients who have obtained employment under the schemes of Care Committees—*e.g.*, as car watchers—are indeed fortunate, for their numbers must necessarily be few. All other patients have to face the open competition of men who are physically sound, and the numbers of these are legion.

The enthusiast will reply that the Village Settlement offers a complete solution of the problem. The writer is inclined to disagree, for two reasons. In the first place, treatment in a village settlement, excellent though it may be, can only be applied to a relatively small portion of the tuberculous population. Secondly, only a small portion of the tuberculous population would consent to be immured in a settlement. As Wingfield[3] truly remarks: "It is sociologically as well as pathologically true that the cure of tuberculosis comes from a source within the patient which we can only guide and not coerce."

The suggestion of Marcus Paterson[4] that a Garden City for Tuberculosis should be built has in it a grain of truth which might be made to germinate freely in different soil. It seems that the only really satisfactory solution of the problem will turn out to be the creation of workshops, where the tuberculous can work under less stringent conditions than are expected in ordinary industrial enterprises. In this connection it is interesting to recall the comparative success which attended the work of the Factory in the Fields at Leeds.[5] Since the failure of the factory in 1927 the scheme has been taken over by the Leeds Corporation; it is now run primarily to enable chosen tuberculous men to regain their working capacity, and to help them to return to their ordinary employment. Several other factories of this type—for example, the Spero Factories—created interest for a few years before they failed economically. To-day the total number of persons employed in these "municipal" workshops probably does not number more than ninety.[6]

Two important points arise from the consideration of these schemes. In the first place, it seems to the writer that a factory or institution which has as its aim the welfare of tuberculous patients until they are fitted for a *permanent* return to their own occupations is working on very optimistic lines. The definite cases of active tuberculosis who show complete recovery are comparatively few. Wingfield, whose experience in these matters is very great, says:[7] "It is generally held that even with the best treatment the average working-class patient cannot overcome the strenuous conditions of modern life." If such workshops are to be established, it would seem to be better that they should be intentionally devised for the use of patients for as long as they need them. If a patient recovers sufficiently to enable him to return to his ordinary work, so much the better. In the second place, the number of patients who have passed through such workshops must be infinitely small in comparison with the total tuberculous population. In other words, these schemes have never had a satisfactory trial.

The writer suggests that the present sphere of activity of most Tuberculosis Care Committees is much too local. Each Committee serves a small area in which it is very difficult to get anything done. If, for employment and housing purposes, Committees were formed to serve large areas—for example, that of a moderate-sized county—then it might be possible to give this workshop scheme a fair trial. Patients would be recommended for admission to these "Health Workshops" (as they might be called), and they would be "signed on" when vacancies occurred. There would be one series of workshops for each large area. The larger sphere of activity of the Committee would mean increased powers, and there would probably be no difficulty in having municipal houses reserved for the workers. This would be

especially the case since the workers would be earning at least sufficient to pay the rent and to maintain themselves. Since patients and their families would occupy ordinary municipal houses wherever they happened to be vacant, there would be no suggestion of "segregation," with its attendant desire of a return to a "normal" life.

This scheme, like its predecessors, will probably be condemned immediately because it is "uneconomic." The reply is that, if the scheme were "economic," it would not be for tuberculous patients, but for the competitive world of industry at large. The question of the *degree* to which the scheme is uneconomic is a different matter. It is suggested that, if areas were large enough and the administration of the scheme satisfactory, the loss need not be very great. In any case it would probably be better to use available funds in meeting this loss, thus achieving enduring results—both physical and moral—in the patients, than to spend them, as is being done at present, in ministering ineffectually to the transient needs of the individual patient.

The writer is strongly of opinion that the present lack of success in the work of Care Committees is largely due to the circumscribed area which each Committee serves. Such a local Committee may well be able to raise funds and dispense them to the best advantage, but it is improbable that it will be powerful enough to demolish the molehill of the housing question or to breast the mountain of unemployment. If a local Committee is not strong enough to sway the decisions of those in the municipal council chambers, how can it be expected to rivet the attention of those who occupy the seats of the mighty in Whitehall? The need is national, and not merely local. If Committees were strong enough, then it would be possible so to influence legislation that houses would be compulsorily set apart for suitable tuberculous cases. Further, by the unification of scattered Committees to form a body which would serve a large area, a scheme of employment such as that suggested might be inaugurated.

In considering the work of individual Committees, it may be said that patients fall roughly into the following four groups: (1) Early cases, before admission to the sanatorium; (2) patients who have made good progress in a sanatorium, and in whose cases a cure may be expected; (3) advanced cases, who cannot be expected to make any material progress; and (4) *the cases who form the majority*, the chronic cases, who for months may be quite well, but who have a periodic breakdown in health. Assistance from local Committees, as at present carried out, would seem to be suitable for the patients in the first three classes. The fourth class calls for a national effort.

In the inauguration of schemes such as those outlined, the paramount necessity is a powerful central body which could co-ordinate the activities of local—or better, of area—Committees, and which

would be strong enough to influence the trend of legislation. An organization such as the Joint Tuberculosis Council or the National Association for the Prevention of Tuberculosis might be willing to undertake this important work of correlation. At any rate, the time seems now to be ripe for some such body to assume organizing control, and for the members of Committees to turn from the tangible needs of the individual patient to the more vital questions which will ultimately bear richer fruit in the individual.

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TONSILS AND ADENOIDS IN RELATION TO TUBERCULOUS INFECTION.

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THE rôle played by the lymphoid tissue of the upper respiratory tract in an individual whose system has been invaded by Koch's tubercle bacillus is not known. Nor can any definite views be held on the subject until a great deal more has been ascertained as to the part this tissue plays in the normal metabolism of the body. It might be of interest, however, to review the main facts in order to bring the subject into clearer focus.

It is now definitely established that secondary infection of the tonsils in patients suffering from pulmonary tuberculosis is relatively common. Strassmann, for instance, found tuberculous lesions in the tonsils in thirteen out of twenty-one autopsies of patients with tuberculosis of the lungs, and Dmokowski discovered the tonsils infected in every case in a series of fifteen autopsies made on advanced cases of pulmonary tuberculosis. Infection in these cases is no doubt carried to the tonsils by infected tuberculous sputum. The main argument in favour of this last statement is the fact that secondary infection of the tonsils is rarely found in cases of advanced pulmonary tuberculosis in

children. Among the latter the sputum is usually swallowed, and does not come into such intimate contact with the tonsils.

Primary tuberculous infection of the tonsil is infrequent. Lermoyez in 1894 was one of the first to publish such a case. Adenoids were removed from a child six years old who had no clinical evidence of tuberculosis in the lungs or elsewhere, and tuberculous giant-celled systems and tubercle bacilli were found in the tonsular tissue. Since then a number of authors have published their statistics. From these one may conclude that in patients showing no clinical signs of tuberculosis, tuberculous lesions can, nevertheless, be demonstrated in the lymphoid tissue of the upper respiratory tract in rather less than 5 per cent. of cases. A. P. Mitchell, to whom we are grateful for much good work on this subject, believes that "tuberculosis of the upper deep cervical glands develops from a primary focus in the faucial tonsils much more frequently than is generally supposed." Whether the tonsil is or is not the primary focus in all cases of tuberculosis of the upper cervical glands, it is established that tonsils sectioned in these cases show tuberculous lesions in approximately 50 per cent. of all cases.

Another fact that may be regarded as settled is that in the great majority of cases of primary tuberculosis of the tonsils the causative agent is the bovine bacillus, and it is now generally held that contamination is caused through infected milk. Brow, of San Francisco, states that "twenty years ago U.S.A. statistics showed a proportion of 10 per cent. of tuberculous tonsils." At the present time he states that owing to the Pasteurization of milk this figure is considerably less, and that this statement is applicable also to tuberculous meningitis. Mitchell found the bovine bacillus in 75 per cent. of cases of tuberculosis of the tonsils in children.

Laryngologists are all agreed that except in very rare cases the clinical diagnosis of tuberculosis of the tonsil is an impossibility. The appearance of the tonsil is no guide whatsoever in the recognition of tuberculous disease. Microscopical evidence of tuberculosis is found both in the large cryptic and in the small fibrous tonsils. Of considerably greater importance than the appearance of the tonsil is the presence of an enlarged gland in the area between the upper part of the sterno-mastoid and the lower jaw immediately over the posterior belly of the digastric muscle. Although it is not possible in the majority of cases to distinguish between an adenitis secondary to infection by the usual pyrogenic organisms and tuberculous adenitis, yet it is generally agreed that the presence of enlarged glands in this situation is perhaps the most urgent indication of enucleation of the tonsils. MacReady and Crowe have emphasized the fact that even if in such cases tuberculous lesions are found to be present in the tonsils

or adenoid tissue after removal, there is no need to be alarmed, "since the majority of these patients will never have clinical symptoms of the disease."

Medical opinion is not unanimous as to whether or not the cervical lymphatic glands which may have become infected from the lymphoid tissue of the upper respiratory tract can spread their infection on to the thoracic mediastinal lymph chain and thence to the lungs. On the whole, one may say that anatomically considered this course of events is not easy to accept. On the other hand, there appears to be definite clinical evidence that such may occur.

To sum up, the two conditions in which tuberculous infection of the tonsils is most frequently found are (1) advanced pulmonary tuberculosis and tuberculous glands in the neck; (2) there is ample evidence that tuberculous adenitis of the neck has followed a primary invasion of the tonsil; (3) primary tuberculosis of the tonsil is in most cases due to infection by the bovine bacillus, and infection has entered the system by way of the alimentary tract.

CRITICAL SURVEY.

THE GERSON DIET IN TUBERCULOSIS: A SUMMARY OF RECENT EXPERIENCE.[1]

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In 1926 there appeared in the *Münchener Medizinische Wochenschrift* an article by Sauerbruch, Hermannsdorfer, and Gerson on a special dietetic method for the treatment of tuberculosis. Excellent results with this diet were claimed in cases of lupus, in bone and joint tuberculosis, and in tuberculous adenitis, while in pulmonary tuberculosis the results were slightly less favourable. The basic principles of this diet were: (1) That it was practically salt free; (2) that it contained vitamins in very large amounts; (3) that phosphorized cod-liver oil and a mixture of various salts called mineralogen were given; (4) that the diet tended to be low in protein and carbohydrate. Since 1926 a great deal of work has been carried out in Germany with a view to confirming these findings, but the results have been very contradictory. It is our intention here to summarize the present position of affairs.

Dr. Gerson has modified his original diet many times—in fact, almost annually—so one cannot be certain without qualification what the diet actually comprises; at any rate, the Sauerbruch-Hermannsdorfer diet has remained much what it was in 1926, and the Gerson diet of 1931 presents many differences which can be conveniently tabulated (see p. 133). It should be emphasized from the start that there is nothing new about the Gerson diet. The restriction of salt and carbohydrates was recommended many years ago in the dietetic treatment of tuberculosis: Czerny observed that tuberculosis tended to be a fatal generalized disease in the young infant, while the older child developed a milder form of the disease, often with the adult characteristic of fibrosis. The great difference between children of these two ages lay in the water content of the body, and by dehydrating the body he argued that improvement should occur. His results with restricting carbohydrates and salt, which tend to store water in the tissues, were excellent.

[1] The survey, kindly provided by Dr. John Gibbens, provides a valuable supplement to the communication provided by Dr. W. Chalmers Watson and published in The British Journal of Tuberculosis in the issue for October, 1930, Vol. XXIV., No. 4, pp. 194-196.—Editor B.J.T.

Gerson, Hermannsdorfer, and Sauerbruch have, however, done a great service to medicine in refocussing medical attention on the factor of diet in the prevention and treatment of disease.

Gerson.	Hermannsdorfer.
Meat: Maximum 100 grammes once weekly.	600 grammes weekly.
Fish: Only 70 grammes weekly.	Plenty allowed.
Milk: 250 c.c. daily.	1 litre daily.
Average protein per day: About 40 grammes.	90 grammes.
Fat: Plenty.	160 to 200 grammes daily.
Cream: Forbidden.	250 c.c. daily.
Potatoes: Plenty.	Maximum: 125 grammes daily.
Only yolk of eggs.	Whole egg.
Raw food: About 1½ to 2¼ litres of fruit and vegetable juice daily.	100 grammes raw food and ¾ pound of raw fruit daily. Fruit juices only in special cases.

It has long been obvious to all that bacteriology and biochemistry, with their elaborate multiplication of detail, have for some time been losing all sense of the whole picture, and the time has now come when the basic principles of treatment—rest, air, light, diet, psychology, etc.—should receive more attention. It is unfortunate that Dr. Gerson has been perhaps a little too enthusiastic about the results of his diet and a little too inclined to underline his own contribution to dietetics; this has tended to discredit his work and to make him an easy target for the sceptic. There can be, however, little doubt about the value of the diet in a number of conditions, and if Dr. Gerson does nothing else, he will at least have raised considerable controversy and interest in the whole subject.

The best results have been obtained in cases of surgical tuberculosis —*i.e.*, tuberculosis of bones and joints and tuberculous abscesses; also good results are found in patients with lupus, and occasionally in those with pulmonary tuberculosis.

We quote two of Sauerbruch's cases:

Case 1.—Severe tuberculous cavity in the right lung treated with an artificial pneumothorax. The cavity, however, perforated into the pleura, and the general condition became so bad that no operation could be safely advised. With the Gerson diet, practical cure.

Case 2.—Left tuberculous empyema with caries of the rib and an open external fistula with mixed infection. Treated at Davos, Arosa, etc., without result; fifteen attempts to cure the empyema fistula surgically; 11 per cent. albumin in the urine. ? Amyloid disease. On

Gerson diet fever disappeared, the albumin in the urine sank to ½ per cent., and there was a gain of 21 pounds in a few months.

Results as good as these, however, have not been found by other observers with any degree of frequency, and some of Gerson's cases have not been controlled carefully enough by repeated X-ray and clinical examinations.

The question now arises, granted that the Gerson diet does improve tuberculous conditions, to what particular constituent in the diet the improvement is to be attributed. It is certain that mineralogen and phosphorized cod-liver oil are not essential for the cure. Bacmeister has attempted to prove that the good results of the diet were due to the cod-liver oil, and that the salt-free diet and the high concentration of vitamins were quite secondary; but Gerson himself showed that in a large number of cases of bone tuberculosis and lupus marked improvement occurred before phosphorized cod-liver oil and mineralogen were given at all. As regards the restriction of salt, the position is less certain. Gerson and his colleagues believe that complete restriction is essential, and many of the bad results seen at first were traced to the fact that patients would take salt surreptitiously behind the scenes. Immediately after beginning the diet he claims that there is a loss of weight from dehydration, then a steep, steady gain, as much as 20 to 35 pounds being put on in four to seven months. On the other hand, Professor Meyer-Bisch, of Dortmund, found that in cases which had gained in weight on the Gerson diet, the giving of 8 to 10 grammes of salt made them lose most of their weight! As far as we know, the Gerson diet with added salt has not been given experimentally to patients. It is probable that the crux of the matter lies in those elusive substances, the vitamins. A cursory examination of the Gerson diet shows that it is roughly a return to a natural type of diet, with rigid exclusion of all those articles which our civilization has taught us to regard as indispensable—preserved and tinned foods, highly purified white flour, large amounts of butcher's meat, condiments and spices, sugars, and carbohydrate foods. Is freshness the key to the riddle, and is the word vitamin synonymous with freshness? Our present habit of allowing a patient to eat a diet which is largely deficient in *fresh* food of all kinds, and then attempting to supply the missing link by the addition of vitamins A, B, C, D, E, is surely to be deplored; yet we are being continually forced into this position by the popular advertisements in the press, and after all it is only too easy for doctors to take the line of least resistance. There can be no doubt that profound changes can be produced in the body by diet; but whether these are changes which the biochemist or bacteriologist will be able to detect must remain doubtful, at any rate for the immediate present. It might be expected, since young animals and plants are highly susceptible to

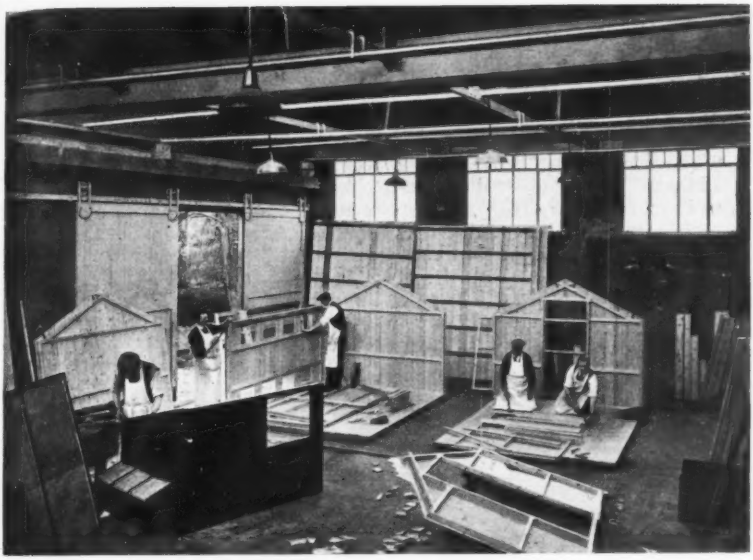
changes of diet, that children would have reacted favourably to the Gerson diet, but this has not proved to be the case; all authors find few good results except in tuberculosis of bones and joints.

One hopes that this diet will be tried in England without the bias which has apparently affected the German results. At any rate it is clear that we must return to diet as one of the few great factors influencing the soil in disease: in which case it would be logical to see the Professor of Nutrition and Dietetics occupying a position in no whit inferior to that of the Professor of Pathology and Bacteriology. Colonel McCarrison's recent lectures at the Royal College of Surgeons on the "Surgical Aspects of Faulty Nutrition" afford strong support of this view.

ASSOCIATIONS AND INSTITUTIONS.

THE EAST LANCASHIRE TUBERCULOSIS COLONY, BARROWMORE HALL, GREAT BARROW, CHESTER.

THIS colony has now completed ten years of existence, and a visitor after inspection of its up-to-date medical arrangements and well-equipped new workshops could hardly deny that it has earned the title of "The Papworth of the North," given to it by a leading north country journal. The East Lancashire County Committee of the British Red Cross Society and Order of St. John of Jerusalem established the colony as a memorial to those who fell in the Great War, and with a view to helping some of those who had contracted pulmonary tuberculosis as a result of war service. It began as a Training Colony for Pensioners with 70 beds. It has since expanded to a very complete colony with a sanatorium of 120 beds, a settlement of 14 married men and 12 single men, and a fine Industries Department. The Ministry of Health have approved the scheme and reported favourably on the Institution. The sanatorium side consists of airy wards in the main building, an additional pavilion for 40 beds, and 22 open-air chalets. All the chalets have been made in the Industries Department, and all the painting and decorating have been carried out by settlers. Patients are admitted to the sanatorium where they receive the most up-to-date and specialized treatment. The occupational therapy is carried out in the Industries Department. The industries carried on are as follows: (1) Manufacture of portable buildings, such as poultry houses, garages, etc.; (2) upholstery; (3) boot repairing; (4) printing; (5) poultry farming; (6) gardening. The industries have worked up from small beginnings, and are now an active trading concern with a considerable turnover requiring the supervision of a manager. Until 1930 the work was carried out in wooden buildings; but a gift of £5,000 from the British Red Cross Society has enabled the Committee to erect a fine, well lit and ventilated concrete building to house all their workshops under one roof. Twelve cottages have been built and occupied by settlers, and two other cottages on the estate have also been used. A hostel for 12 single settlers has also been built and filled. A clinic is held once a month for the wives and children of settlers. There are 28 children in the settlement, 7 of whom were born at Barrowmore, and there has been no case of tuberculosis among them. The colony has been handicapped by lack of funds to assist its development, and is urgently in need of funds for the following purposes: (1) Extending the staff quarters; (2) Building and equipping a new X-ray department; (3) The erection of additional cottages for waiting colonists. Further particulars may be obtained on application to Dr. E. L. Sandiland, the Medical Superintendent.



THE EAST LANCASHIRE TUBERCULOSIS COLONY: INTERIOR OF NEW ERECTING SHOP.

The illustration shows tuberculous men engaged in the construction of open-air shelters and other erections.

THE EAST LANCASHIRE TUBERCULOSIS COLONY: INTERIOR OF NEW WORKSHOP.

The illustration shows tuberculous men engaged in various forms of joinery and carpentering.

The Seventeenth Annual Conference of the National Association for the Prevention of Tuberculosis was held at Margate, June 25 to 27, under the Chairmanship of Sir Arthur Stanley, G.B.E., C.B., M.V.O., Chairman of the Council. The general subject for consideration was "The Protection of the Child from Tuberculosis." Introductory addresses were delivered by Sir Robert Philip, Dr. Eugene L. Opie, and Dr. Letitia Fairfield, and in the ensuing discussions the following took part: Sir Henry Gauvain, Dr. Ralph Crowley, Dr. T. Midgley Turner, Dr. L. S. T. Burrell, Dr. T. R. Elliott, Dr. Jewsbury, Dr. Nathan Raw, and Major D. S. Rabagliati, O.B.E., F.R.C.V.S. A large number of the delegates took part in the Conference. Visits were paid to various local instutitions, including the Royal Sea-Bathing Hospital, Princess Mary's Hospital for Children, Victoria Home for Invalid Children, Garlinge County School, Country Branch of Cheyne Hospital for Children, Fairfield House Open-Air School, and the Shaftesbury Society's Rob Roy Residential School for Crippled Girls. Canterbury and other places of interest were visited.

The National Association for the Prevention of Tuberculosis, the headquarters of which are at Tavistock House North, Tavistock Square, W.C. 1, has rendered a notable service by the issue of its "Handbook of Tuberculosis Schemes for Great Britain and Ireland." A Sixth Edition, thoroughly revised and brought up to date, has just been issued (price 5s., post free). This invaluable reference book of 160 pages should be in the hands of every Medical Officer of Health, Tuberculosis Officer, and all others responsible in any way for the organization and administration of our national tuberculosis service. Particulars are given regarding tuberculosis work in each administrative area in England, Wales, Scotland, Channel Islands, Northern Ireland, and the Irish Free State, including statistical data and other practical information. The handbook furnishes the only available list of Tuberculosis Officers and complete record of residential institutions for tubercular cases. There are a number of instructive charts. The work in shape, form, arrangement, and general get-up is excellent, and all concerned in its production are to be congratulated. Orders for the volume should be sent to the Secretary, Miss F. Stickland, N.A.P.T., at the above address.

The next Congress of the International Union against Tuberculosis will be held at the Hague and Amsterdam, under the presidency of Professor W. Nolens, September 5-12, 1932.

NOTICES OF BOOKS.

CONTINENTAL WORKS.

PROFESSOR A. GOTTSTEIN has published an instructive work on the epidemiology of tuberculosis in the series "Die Tuberkulose und ihre Grenzgebiete in Einzeldarstellungen," edited by Drs. L. Brauer and H. Ulrici.[1] This treatise does credit to the perseverance and patience of the author, as he has collected statistics from practically every European country as well as from other continents. These statistics deal with every form of tuberculosis in every age of patient, dating from the year 1870 onwards, and are arranged as comprehensive tables and charts. The author classifies his statistics in age groups. Infants showing acute generalized infection with high mortality provide an example of the reaction of unimmunized man towards tuberculous infection. It is claimed that this group, though of great clinical significance, is unimportant for general statistical purposes, as it is almost always the final link in the chain of infection. The group of young children shows differentiation of local infection with lower mortality depending on the infected area. School children exhibit a tendency towards quiescent disease, and infection depends largely on prolonged contact with the infecting agent. At puberty there is an increased mortality, slightly greater in females. Finally, data relating to adult tuberculosis are considered. The important evidence presented centres round the epidemiological problems of pulmonary tuberculosis in adults of working age, of whom 80 per cent. of males and 70 per cent. of females die within three years. While the average duration of the disease is three to four years, many die within a few months of diagnosis, and others live for years and even decades. The curve is extraordinarily constant; it rises precipitately, falls sharply at first, and is then carried forward in a slowly falling line. The decrease of the death-rate from tuberculosis in all civilized lands since about 1890 is striking and constant. It is generally attributed to better hygienic conditions, but this the author states is not really an explanation. Consideration should be given to increased medical knowledge leading to earlier diagnosis and treatment, and especially to the fact that this can now be brought to bear on the masses as well as on the classes. For anyone interested in elaborate statistics, Dr. Gottstein's treatise should prove a happy hunting ground. ROSE JORDAN, M.D.

Dr. Hanns Alexander has written a short monograph on the production of artificial pneumothorax in the treatment of pulmonary tuberculosis, giving consideration to the anatomical and physiological relations of the thoracic viscera, the indications for and against this special form of treatment, methods of performing the operation, results and complications, together with short references to bilateral artificial

[1] "Allgemeine Epidemiologie der Tuberkulose." By A. Gottstein. Pp. 123. Berlin: Julius Springer, Linkstrasse, 23. 1931. Price, Rm. 10.80; Geb., Rm. 13.50.

pneumothorax, oleothorax, phrenic evulsion and thoracoplasty.[1] The work is excellently arranged, clearly worded, and gives the impression of fair, unbiassed opinion as to the benefits and dangers of artificial pneumothorax treatment in general. The author names as the most suitable subjects those with severe unilateral disease who have not benefited by sanatorium treatment and form a source of chronic infection. He states that one-third are cured, one-third improved thereby, and that probably more than 10 per cent. of persons affected by pulmonary tuberculosis are suitable for artificial pneumothorax treatment. As regards duration of treatment, the sputum should be persistently negative for a year, so that for slighter cases one and a half to two years' treatment may be necessary, and for more severe cases three to four years. Dr. Alexander makes a special point in treatment by artificial pneumothorax of "early infiltrates" (*frische Infiltrate*) forming "round cavities" (*Rundkaverne*), which may require only ten to twelve months' treatment on account of the absence of adhesions and the collapsibility of the cavity wall. Should active signs with positive sputum continue after two to three years' treatment, performance of thoracoplasty should be considered. The commonest complication is an effusion, which occurs in 30 to 100 per cent. of cases, and is always undesirable. Contra-indications for artificial pneumothorax treatment are very acute infections, tuberculosis of intestinal organs, caries, bilateral renal disease, emphysema and asthma, severe diabetes and uncompensated cardiac disease. Bilateral artificial pneumothorax is carefully considered in relation to vital capacity, and is specially effective in early infiltrates with a tendency to rapid dissemination. Performance of phrenic evulsion, causing as it does paralysis of the diaphragm and allowing its unrestricted distension on the admission of air into the pleura, should be carefully weighed in the balance. Oleothorax requires very careful handling on account of very serious complications which may arise. Dr. Alexander's work deserves thoughtful study.

ROSE JORDAN, M.D.

The third volume of the monumental textbook which is being edited by Assmann, Beitzke, Braeuning, and Engel is a reference work of first-class importance. It is produced in the style which we expect from Germany nowadays, with good printing and really excellent reproductions of X-ray photographs.[2] The volume is divided into eight sections, each written by a different author; to us the three most interesting chapters are those dealing with pulmonary tuberculosis at puberty from a clinical point of view, the general treatment of tuberculosis, and pregnancy and tuberculosis. This last affords an especially good and comprehensive review of present knowledge on the subject. It is interesting to note that the much-discussed Gerson diet is looked on with disproval, also to see the figures now produced by l'Œuvre Grancher. Of 23,000 children born of tuberculous parents and removed to the country, only seven are said to have fallen ill with tuberculosis; and of 2,450 children in a similar Belgian institution, only one died

[1] "Der Künstliche Pneumothorax." By Dr. Hanns Alexander, of Agra. Pp. 42, with 45 illustrations. Berlin: Julius Springer, Linkstrasse 23. 1931. Price Rm. 7.50.

[2] "Ergebnisse der Gesamten Tuberkulose Forschung." Vol. III. Edited by Assmann, Beitzke, Braeuning, and Engel. Pp. 695. Leipzig: Georg Thieme, Autontrasse 15. 1931. Mr. 57.60; Geb. 59.60.

of tuberculosis—surely a powerful argument against the importance of heredity in tuberculosis. Editors, contributors and publishers are to be congratulated on the effectiveness of this indispensable reference work. JOHN GIBBENS, M.B., M.R.C.P.

Dr. Tendeloo's new work will be of interest to chest experts.[1] It is divided into three parts: (*a*) physiological; (*b*) pathological; and (*c*) ætiology and course of infectious pulmonary inflammations. The author deals with the three great lung diseases—pulmonary tuberculosis, lobar pneumonia, and acute broncho-pneumonia—and postulates six questions: (1) Where does the infection begin and to where does it proceed? (2) What microbe is the infecting agent? Is the infection primary or secondary? (3) How do the pathological factors influence the ætiology? (4) Is the further extension of the disease due to the same factors as produce the original infection? (5) What influence has the site of the lesion on the nature of the tissue changes and the course of the disease? What other factors influence the course of the disease? (6) What is the path of infection? The book affords a full discussion regarding these points and there is a serviceable bibliography. JOHN GIBBENS, M.B., M.R.C.P.

Dr. Bacmeister has prepared a good general textbook on diseases of the lungs, including tuberculosis.[2] It is furnished with excellent X-ray photographs. Details of treatment with prescriptions in full are given and in great variety. A chapter is devoted to syphilis of the lung; there is an X-ray photograph of tertiary syphilis of the lung, and the author briefly describes gummata with secondary softening (cavity formation and calcification being rare), chronic syphilitic interstitial pneumonia, and syphilitic ulcers of the larynx, trachea and bronchi. The book contains no references, but this does not lessen its practical value. JOHN GIBBENS, M.B., M.R.C.P.

Drs. Brednow and Hofmann are to be congratulated on having produced an excellent atlas of lung conditions.[3] The illustrations, eighty-five in number, are well reproduced from carefully chosen negatives, each of which demonstrates clearly the point for which it was selected. Each occupies a full page, and is therefore sufficiently large to enable its detail to be studied. A number of malignant and inflammatory conditions are included, but the greater part of the work deals with the recognition of the various lesions of tuberculosis. The descriptions of the plates are full, and are conveniently arranged side by side with the radiographs, so that the explanations can be followed without effort. The atlas will be of practical use to physicians and radiologists, and can be recommended as an excellent guide to students of chest radiography. J. E. A. LYNHAM, M.D., M.R.C.P.

Dr. F. Koesler has provided an interesting monograph for the series edited by Dr. Kurt Klare-Scheidegg-Allgäu.[4] It summarizes con-

[1] "Studien über die Entstehung und den Verlauf der Lungenkrankheiten." By Dr. N. Ph. Tendeloo. Pp. 209, with 6 figs. Münich: Bergmann. 1931. Price Rm. 26.

[2] "Lehrbuch der Lungenkrankheiten." By Adolf Bacmeister. Pp. 404. Leipzig: Georg Thieme. 1931. Price not stated.

[3] "Röntgenatlas der Lungenerkrankungen." By Dr. W. Brednow and Dr. E. Hofmann, Göttingen. Pp. 168, with 85 skiagrams. Berlin and Vienna: Urban and Schwarzenberg. 1931.

[4] "Roentgendiagnostik der Lungentuberkulose und ihre Bedeutung im Rahmen der Gesamtuntersuchung." By Dr. Friedrich Koesler. Praktische Tuberkulose-

clusions arrived at in the sanatoria of the State Insurance Institute of Westphalia. The text is based on lectures and demonstrations delivered during post-graduate courses. They form an introduction to the use of radiology in relation to pulmonary tuberculosis and its complications. The text is concise, and is illustrated by a number of skiagrams. It deals at first with the rationale and technique of chest examination, and then deals systematically with the various aspects of pulmonary tuberculosis. J. E. A. LYNHAM, M.D., M.R.C.P.

Dr. Carl Rupilius has issued a preliminary account of certain experiments made with B.C.G. on guinea-pigs and on children.[1] He found that B.C.G. given by the mouth produced variable and unreliable results, and he therefore restricted the administration to subcutaneous inoculation. Tuberculous lesions were produced in both animals and children; these are said always to retrogress. It is stated that no increase of virulence in B.C.G. was observed. An immunizing effect is considered to have been obtained with small doses of the vaccine. Professor Hamburger's prefatory note dwells chiefly on the merits of the bibliography. Dr. Rupilius's work does not carry us far in the vexed subject of B.C.G. inoculation. He admits that the process is not yet ripe for general use. A. S. M.

A comprehensive and authoritative textbook on the surgery of tuberculosis has recently been issued by Clairmont, Winterstein and Dinitza of the Surgical Clinic of the University of Zürich.[2] The work is a monumental one and meets a real need. Let us say at once that such a volume should speedily be available in English. Even to those who are not at home with the German language the work is particularly instructive through its numerous and well-selected illustrations. It is a reference book of first-class importance, and is worthy of the great medical school of Zürich. The book is divided into twelve sections, dealing with tuberculous lesions as met with in the various systems of the body. The reproductions of actual photographs not only afford admirable clinical pictures of the various forms of tuberculous involvement, but in many cases indicate the results of operative, general, or special treatment. Particular praise must be allotted to the series of exceptionally fine X-ray photographs. A considerable number of the illustrations are coloured and effectively reproduce the natural appearances of the morbid conditions depicted. In connection with each important section is a serviceable bibliography, and among the references we are glad to see the names of many English authorities. All who have co-operated in the production of this unique and complete exposition of surgical tuberculosis are to be congratulated, for they have produced a work which should be in the hands of every tubercu-

Bücherei. Beihefte der Praktischen Tuberkulose-Blätter. Herausgegeben von Dr. Kurt Klare-Scheidegg-Allgäu. Heft 6. Pp. 40, with 30 illustrations. Stuttgart: Ferdinand Enke. 1931. Price Rm. 2.80.

[1] "Über die Tuberkulose—Schutzimpfung mit B.C.G. (nach Calmette)" ["On Protective Inoculation against Tuberculosis with B.C.G. (according to Calmette)"], by Dr. Carl Rupilius, with a prefatory note by Professor Dr. Franz Hamburger of Vienna. Beihefte zum Archiv für Kinderheilkunde. 1. Heft. Pp. 56. Stuttgart: F. Enke. 1931. Price Rm. 4.

[2] "Die Chirurgie der Tuberkulose." By P. Clairmont, O. Winterstein and A. Dinitza, der Chirurgischen Universitätsklinik, Zürich. Pp. 661, with 392 illustrations, many in colours. Berlin: S. Karger, Karlstrasse 39. 1931. Price Rm. 63.

losis expert. We trust that it will not be long before an English version will be available for British and American and other English-reading surgeons and tuberculosis specialists, but it is essential that in any such edition all the illustrations must be reproduced.

The famous publishing house of Masson et Cie, of Paris, have recently issued a beautiful two-volume work of which all concerned in its production may justly be proud.[1] The title page bears the names of E. Sergent, F. Bordet, H. Durand, and J. Courveux, and the work is an impressive witness of the value of team work and scientifically directed co-operation in medicine. These handsome albums occupy a unique position among modern publications relating to disease of the respiratory system. Such a monumental work of reference and instruction as this should be studied by all who have to deal with chest care. We would especially commend it to the notice of tuberculosis officers, medical superintendents of sanatoria, and all physicians who have to advise in regard to patients suffering from tuberculosis or other affections of the lungs and other structures of the respiratory apparatus. The authors designate their work an Iconographie, and indicate that the radiographs reproduced have been collected in the course of ten years' *service de clinque*. Each radiological exploration is appropriately spoken of as "une autopsie sur le vivant." Such an Iconographie brings to every medical practitioner means for developing powers whereby an exact interpretation may be made of radiological images. The work is divided into three parts: The Technique of Radiological Exploration; Descriptions of "Images Radiologique," Normal and Pathological; and "Les Images Radiologiques dans les Etats Pathologiques des divers Parties de l'Appareil Respiratoire." The second volume contains a wonderful collection of radiograms of various pulmonary cases, and accompanying a number of them are illustrations of pathological conditions discovered post-mortem. A special section is devoted to Pneumopathies Tuberculeuses, and here are admirably portrayed the various forms of tuberculous disease involving the lungs. We particularly commend the study of the fine series of plates in this section to all present-day clinicians responsible for the investigation of the subjects of pulmonary tuberculosis. Perhaps it might be possible to arrange for the issue of this remarkable section as a separate fasciculus. We have nothing but admiration for the work, regarding which this short notice is all too inadequate. We urge our readers to study the whole series of 179 plates composing this unique Iconographie.

Professor M. Piéry, of Lyons, and Dr. J. Roshem, of Cannes, have written a history of tuberculosis for the "Bibliothèque de la Tuberculose," the chiefs of which are Professors Chantemesse, Poucet and Collet, with Professor M. Piéry as Secrétaire-Général.[2] Such a work as this

[1] "Exploration Radiologique de l'Appareil Respiratoire." Par Emile Sargent, Professeur à la Faculté de Médecine de Paris; Francis Bordet, Ancien Chef de Clinique de la Faculté de Médecine de Paris; et Henri Durand, Chef du Laboratoire de la Clinique de la Charité, avec la collaboration technique de J. Courveux, Chef du Laboratoire de Radiologie de la Clinique de la Charité. Pp. 465, avec 639 figures, dont 580 radiographies. Paris: Masson et Cie, 120, Boulevard Saint-Germain. 1931. Prix Fr. 350.

[2] "Histoire de la Tuberculose." Par M. Pièry, Professeur à la Faculté de Médicine de Lyon and J. Roshem de Cannes, Membres de la Société d'Histoire de la Médecine. Pp. xv+479, avec 77 figures dans le texte. Paris: G. Doin et Cie, 8, Place de l'Odéon. 1931. Prix frs. 80.

will be of interest not only to medicals, but to many thoughtful patients and others engaged in the care of the tuberculous and the combat with tuberculosis. We hope an English translation will be available before long, for it is a work which should have a large circulation in America and in this country and among all English-speaking peoples. The work opens with an account of tuberculosis in prehistoric and ancient times, and then follow chapters on phthisis in the time of Arabic medicine and the Middle Ages, and from the days of the Renaissance up to the nineteenth century. The chapters of greatest interest to present-day readers are those which deal with the evolution of modern ideas and clinical methods regarding pulmonary tuberculosis, together with the sections on pathology, contagion, heredity, prophylaxis, and the nature of various tuberculous lesions. Much attention is rightly devoted to records relating to the recognition and treatment of pulmonary tuberculosis. The work is notable not only on account of the text, but also for its excellent series of illustrations, and particularly for the reproductions of portraits of those who have devoted special study to tuberculosis. There is also an elaborate bibliographical index as well as an index to authors.

In the admirable series of eight volumes composing the elaborate system "Le Précis de Pathologie Médicale" there is one devoted to an exposition of diseases of the respiratory system.[1] A second edition of this serviceable manual has just been issued, and should be in the hands of all physicians and general medical advisers dealing with cases of pulmonary tuberculosis and other diseases of the organs of respiration. It is just the sort of work which will be of service to tuberculosis officers, for it provides in compact, well-arranged form a complete up-to-date survey of the anatomy, physiology, pathology, and clinical features of all pulmonary affections and other disorders affecting the respiratory tract. Although manifestly intended for French senior students and practitioners, the work deserves to be known and used by English medical men and women. A considerable part of the volume is devoted to tuberculosis of the larynx, pleura, lungs and mediastinum. The numerous figures and excellent reproductions of X-ray photographs of the chest add much to the value of the book. There is also a good index.

The Comité National de Défense contre la Tuberculose, the headquarters of which are at 66, Boulevard Saint-Michel et 3, Rue Auguste-Comte, Paris (VI^{e}), have issued a valuable volume of statistics.[2] The work, which has been compiled by Dr. Marcel Moine, the statistician of the service, consists of five chapters in which is elaborately set forth in a series of tables exact data regarding tuberculosis and practical measures for dealing with the disease in France. In the concluding

[1] "Maladies de l'Appareil Respiratoire." Par Fernand Bezançon, Professeur de Clinique Médicale à la Faculté de Médecine de Paris, et S.-I. De Jong, Médecin des Hôpitaux de Paris. Avec la collaboration du Docteur André Bloch pour l'Oto-Rhino-Laryngologie. Deuxième édition refondue. Pp. viii + 747, avec 36 planches et 68 figs. Paris: Masson et Cie, 120, Boulevard Saint-Germain. 1931. Prix Fr. 70.

[2] "Publications du Comité National de Defense contre la Tuberculose—Rapport du Service de la Statistique: Année 1929." Pp. 200. Melun: Imprimerie Administrative. 1930. Price 25 frs.

section is a valuable comparison of French and English statistical data which will be of interest and value to workers both in France and this country.

LIGHT THERAPY.

Dr. W. Kerr Russell has contributed to the Modern Treatment Series of practical handbooks, edited by Dr. F. G. Crookshank, a manual for the busy general practitioner on ultra-violet radiotherapy.[1] It is an admirable introduction to radiotherapy, condensed, succinct, lucid, and practical. Much serviceable information has been compressed into the eight chapters comprising the volume. After an interesting historical account of the subject, the author presents a clear summary of the essentials of the physics of radiation and the electromagnetic spectrum, and the physiological basis of ultra-violet radiotherapy. A brief but good description is given of the apparatus used in actinotherapy and methods of administration. Then follow chapters on the forms of local treatment. Dr. Kerr Russell claims that tuberculous conditions of the bones, joints, glands, peritoneum, pleura, genito-urinary system, and skin all show a favourable response to ultra-violet treatment. It is stated that "early cases of afebrile tuberculosis can be safely irradiated, but a rise of temperature or pulse-rate, or the appearance of hæmoptysis, are indications for the cessation of treatment." Dr Russell has provided hard-working doctors with just the exposition and guide which will be of real service in general practice, and to all such we commend his up-to-date and helpful volume.

Dr. Hugo Bach's authoritative work on actinotherapy is now available in an excellent English version, thanks to Dr. R. King Brown.[2] It is a comprehensive guide to light therapy, dealing mainly with the use of artificial sources of light, and particularly the employment of the excellent Quartz lamps designed by Bach and Jesionek, the water-cooled quartz lamp designed by Kromayer, and the Sollux lamps of Oeken and Cemach. Dr. Bach distinguishes between ultra-violet therapy and hyperæmia therapy. Light therapy is a physiotherapeutic measure in which the external covering of the body affords the point of attack. "The various physiological functions of the skin, its powers of absorption, transpiration, secretion of fatty matters and perspiration, regulation of bodily warmth, functions as a sense organ, and that property which is designated esophylaxis, make it intelligible that physiotherapeutic measures affect the most diverse disorders of the bodily economy." Dr. Bach's work is divided into three parts, dealing respectively with Ultra-violet Therapy, Instruments, and Indications and Uses of the Quartz Lamps. It provides a reliable and com-

[1] "Ultra-Violet Radiotherapy." By W. Kerr Russell, M.D., B.S., Medical Officer in Charge of Light and Electrical Departments at the Miller General Hospital for South-east London, etc. Pp. 130. London: Jonathan Cape, Ltd., 30, Bedford Square, W.C. 1. 1930. Price 5s.

[2] "Irradiation with the Alpine Sun Quartz Lamp, including Some Account of Luminous Heat Rays." By Dr. Hugo Bach, Geh. Sanitätsrat, Dresden, with the assistance of Dr. Ferdinand Rohr. Authorized English edition. Edited by R. King Brown, B.A., M D., D.P.H., Medical Editor, *British Journal of Actinotherapy and Physiotherapy*. Pp. viii + 218, with 23 illustrations. Slough: The Sollux Publishing Co. Price 10s. 6d. net.

plete guide to artificial light treatment, and the excellent illustrations add much to its value. It is certainly a work which all making use of artificial light as a therapeutic agent cannot afford to neglect. There is an informing section on "The Action of Ultra-Violet Rays and Foodstuffs." Readers of this JOURNAL will be specially interested in the author's informing chapter on light treatment in tuberculosis, for it provides an admirable survey of known facts and review of practical experience in regard to the rôle of actinotherapy in the treatment of tuberculous disease involving various parts of the body. "The theory is that the irradiations favourably affect the formation of every kind of antigen, more particularly that of the albuminous, and, to a lesser extent, of the fatty antigens to which an important part is ascribed in the cure of tuberculosis. Further, the stimulating effect of the ultra-violet rays on the skin promotes improved circulation, which leads to a favourable reaction upon the tuberculous focus, and possibly encourages the excretion of toxin." Dr. Bach speaks highly of quartz lamp radiation treatment in the initial stages of pulmonary and laryngeal tuberculosis. Serviceable directions regarding dosage are given. There are particularly suggestive chapters on the use of actinotherapy in surgery and pediatrics. The English version of Dr. Bach's able monograph has been worthily provided in a good translation, printed on art paper, and provided with effective indexes of authorities and subjects. Everyone using the quartz lamp in this country should read the English edition of Dr. Bach's pioneer book, which has found much favour on the Continent.

MANUALS FOR MEDICAL ADVISERS AND WORKS OF REFERENCE.

Professor Ernest W. Hey Groves is the author of a justly popular and most useful synopsis of surgery, a member of the admirable synopsis series published by Messrs. John Wright and Sons, Ltd., of Bristol.[1] The work, first issued in 1908 and now in its ninth edition, is an indispensable epitome of all salient points in surgical practice, so arranged as to be available not only for students preparing for examinations, but for practitioners desiring information and guidance in a concise, practical and readily accessible form. The new edition has been thoroughly revised and brought up to date in accordance with present-day knowledge and modern teaching. Many sections have been re-written and new ones have been added. There are excellent accounts of the various forms of surgical tuberculosis, specially serviceable sections being devoted to tuberculous disease of joints, bones, glands, and other structures. There is an excellent chapter on diseases of the air-passages and chest. The work is effectively arranged, printed on good paper, provided with practical index, and there are also a number of instructive figures. Professor Hey Groves's Synopsis should be in the hands of every medical practitioner.

Mr. J. Coutts, Deputy Curator of the Royal Botanic Gardens, Kew, has produced an impressive guide to gardening, large, comprehensive,

[1] "A Synopsis of Surgery." By Ernest W. Hey Groves, M.S., M.D., B.Sc., F.R.C.S., Surgeon to the Bristol General Hospital and Professor of Surgery in Bristol University. Ninth edition. Pp. viii + 675, with 12 plates and 148 figures. Bristol: John Wright and Sons, Ltd. 1930. Price 17s. 6d.

practical and beautifully illustrated.[1] This exceptionally detailed, informing and thoroughly serviceable work should be in the hands of all who, in sanatoria, open-air schools and settlements, as well as those who in connection with country houses and gardens everywhere, are lovers of flowers and fruits and all kinds of plants and desire guidance in regard to their culture. Mr. Coutts' authoritative work opens with a calendar of work for the months of the year, and chapters dealing with the general principles and practices of gardening. Then follow chapters on the Herbaceous Border, the Rock Garden, the Wall and Paved Garden, and Water and Bog Gardens. An alphabetical list of flowering plants and shrubs describes the culture of over 600 different species. Every branch and phase of horticulture seems to have received consideration. There are excellent accounts of fruit culture and the propagation of vegetables. The book closes with an interesting and accurate account of diseases and pests which threaten plant life. Special praise must be given to the charming illustrations in colour and for the attractive form in which the publishers have issued this ideal and standard work on gardening at so moderate a price that it is within the reach of all garden lovers.

Mr. Edwards' informing and beautiful volume on rock, water and bog gardens will be admired and studied by all gardeners and lovers of plant life.[2] It is a work which we specially commend to the attention of those connected with sanatoria and open-air schools, as well as all doctors, nurses and others who have an opportunity of making and tending a real rock garden. Patients and those who live an open-air life will gain much health and happiness by ministrations connected with rock gardens and the culture of alpines, bulbs, shrubs, ferns, ornamental grasses and other plants that delight to develop among the rocks or in marshy places. The coloured illustrations are a feature of Mr. Edwards' fine book, which also provides a number of tables affording in alphabetical order and condensed form essential data regarding all varieties of plants suitable for rock and water gardens. The latter half of the book consists of descriptions, alphabetically arranged, of the best species and varieties suitable for cultivation in rock, wall, paved, water and bog gardens. Mr. Edwards' authoritative, comprehensive, practical and appealing book will prove a charming present for garden lovers, for it is a standard work of reference.

The Gardening Year-Book issued by *The Smallholder* is a publication which will appeal to lovers of gardens and those interested in outdoor activities.[3] It will be of service to many tuberculous subjects capable of engaging in open-air enterprises There are sections on horticulture, allotments, the keeping of poultry, rabbits, pigs and bees, and much else of interest to smallholders.

Mr. A. H. M. Ward has added to "The Motorist's Library" a

[1] "Everyday Gardening." By J. Coutts, A.H.R.H.S. Pp. 448. With 8 plates in colour, 32 full-page illustrations from photographs, and many diagrams. London: Ward, Lock and Co., Ltd., Warwick House, Salisbury Square, E.C. 4. 1931. Price 7s. 6d.

[2] "Rock Gardens and How to Plan and Plant Them. With Sections on the Wall, Paved, Marsh, and Water Gardens." By A. Edwards, in charge of the Rock Garden, Kew. Pp. 320, with 8 plates in colour and 50 photographs and diagrams. London: Ward, Lock and Co., Ltd. 1930. Price 7s. 6d.

[3] "Gardening and Poultry-Keeping Year-Book, 1931." Twentieth year of issue. Pp. 255. London: C. Arthur Pearson, Ltd., offices of *The Smallholder*, 16-18, Henrietta Street, Covent Garden, W.C. 2. 1931. Price 2s.

thoroughly practical handbook on caravanning and camping,[1] which as Sir Arthur Stanley declares in his commendatory foreword is "a real *vade mecum* for the camper." It sets forth in attractive form the delights and benefits to health of caravan or tent life, and affords practical directions regarding choice of country, transport, caravans, trailers and tents, equipment, conduct of camping life, provision of stores, catering and cookery, together with notes on first-aid. The appendices give particulars regarding the law applying to caravans and trailers and notes on the legal aspects of camping. There is also a serviceable list of steep hills. The book also contains many interesting and useful advertisements. The coming of the motor with the development of trailers, caravans, and practical equipment for car-cruising, camping and tent life has provided valuable means for the organization of health-giving holidays and for the carrying out, for tuberculous and other delicate subjects needing an open-air and country life, of ideal health conditions.

The Federation of Rambling Clubs has published an informing Year Book which should be in the hands of all ramblers, campers, hikers, and others desiring to organize ideal holidays and live the open-air life.[2] It contains signed articles of much interest, particulars regarding the Youth Hostels Association of Great Britain and other bodies, descriptions of rambles and country districts, a bibliography for ramblers, and a directory of recommended houses for refreshment in the Home and other Counties. The numerous advertisements add to the practical value of the handbook.

The League of Nations has just issued The International Health Year Book, now in its fifth year.[3] This impressive and monumental volume contains official communication from the Health Deparments of forty countries covering five continents. Particulars are presented regarding measures of defence introduced to prevent epidemics, campaigns conducted against social ills, and various enterprises and endeavours to raise the level of public health. A considerable part of the volume is devoted to standard and comparable tables dealing with vital and nosological statistics. There are also important contributions from Colonial Health Administrations. A section is devoted to Tuberculosis, and there is a particularly serviceable chapter on Industrial Hygiene. The volume concludes with an Account of the Health Organization of the League of Nations. This remarkable reference work should be available for everyone engaged in the organization and administration of public health services in this and all other countries.

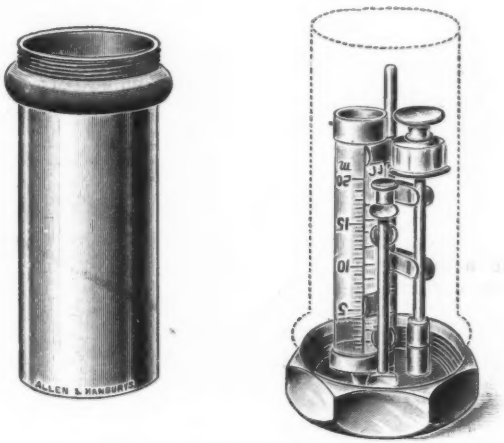
[1] "Caravanning and Camping: A Complete Guide to Camping and Motoring with Caravan or Tent." By A. H. M Ward, M.A. Mechanical Engineering. With a Foreword by the Hon. Sir Arthur Stanley, G.B.E., C.B. Pp. xii + 170, with illustrations. London: Sir Isaac Pitman and Sons, Ltd., Parker Street, Kingsway, W.C. 2. 1931. Price 2s. 6d.

[2] "The Rambler's Handbook," being the official Year Book of the Federation of Rambling Clubs for the year 1931. Pp. 118 + 20 + 28 + 16. London: E. J. Larby, Ltd., 30, Paternoster Row, E.C. 4. 1931. Price 6d.

[3] "The International Health Year Book, 1929 (Fifth Year): Reports (with Vital and Public Health Statistics) on the Public Health Progress of Forty Countries and Colonies in 1928." Pp. 1504, with three folded sheets. Published by George Allen and Unwin, Ltd, League of Nations Publication Department, 38, Great Ormond Street, W.C. 1. 1931. Price: wrappers, 24s. or $6; cloth bound, 32s.

PREPARATIONS AND APPLIANCES.

THE PAUL HYPODERMIC SYRINGE, the chief features of which are indicated in the accompanying illustration, will be welcomed by the general practitioner, and should prove of service to tuberculosis officers engaged in dispensary and domiciliary treatment of all tuberculous cases. It will also be approved by medical superintendents of sanatoria.[1] The syringe fits into an all-metal, nickel-plated case, intended to be filled with rectified spirits, so maintaining an aseptic condition. The case has a cone-fitting cap, which ensures absolute freedom from leakage and makes the use of washers unnecessary. The hexagonal



THE PAUL HYPODERMIC SYRINGE.

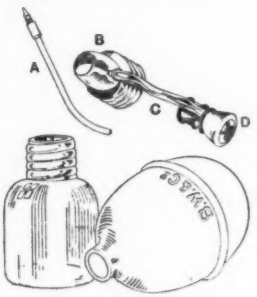
top of the case facilitates opening and closing, and when unscrewed and placed upside down acts as a stand for the syringe and its components. The pillar of the stand is attached to the cap, so that the withdrawal of the cap removes the syringe and its attachments at the same time. The syringe is effectively designed and constructed; the barrel, piston, and needles are mounted separately, so that there is no possibility of the piston getting stuck in the barrel should the syringe only be used at infrequent intervals. This brief description will be sufficient to indicate that this new syringe and case is a very desirable possession for every practising doctor. The price is £1 1s. 6d..

[1] The Paul Syringe is supplied by Allen and Hanburys, Ltd., 48, Wigmore Street, W. 1.

THE HEWLETT MOTOR-CAR EMERGENCY CASE meets a very real need, and is an equipment which may well be in the possession of every doctor and motorist.[1] As shown in the accompanying figure, this desirable equipment consists of a strong, conveniently shaped japanned tin case with handle. The case contains: Sal volatile in 1-ounce stoppered bottle; 1 ounce absorbent wool; 1 ounce surgeon's lint; tin of vaseline; glass pencil containing iodine tincture, in metal case; tin of rubber adhesive plaster, 1 yard by 1 inch wide; tin of assorted sizes safety pins; pair of scissors, blunt and sharp points, 5 inches long; pair of artery forceps, which can also be used as tweezers; tourniquet; bleached water dressing bandages 2½ inches, 2 inches and 1 inch; ½-yard packet acriflavine or picric gauze; 1 ounce ung. terebini co., for burns, in china pot; and a packet of battiste 9 inches by 9 inches. The price complete is 18s. 6d.

THE HEWLETT MOTOR-CAR EMERGENCY CASE.

THE "PAROLEINE" ATOMISER is a thoroughly reliable appliance for the application of oily medicaments to the naso-pharynx. Its essential features are shown in the accompanying illustration.[2] It is simple in construction and, as all parts except the bulb are made of glass or metal, it can be readily sterilized. "Paroleine" Brand Liquid Paraffin is an ideal medium for selected medicaments, and "Paroleine" Spray Compound provides an ideal spray. (The price to the medical profession is 6s.)



THE "PAROLEINE" ATOMISER.

A, metal tube; B, nickel-plated metal attachment; C, valve; D, gauze-wire screen.

THE DUTCH WEATHER GLASS may well have a place in sanatoria, open-air schools, and other institutions where weather conditions are studied.[3] It is an ingenious and interesting novelty for every home, and should be specially appreciated in country districts. The appliance consists of a special glass body with an elongated spout, and there is a glass loop providing for attachment to a wall or other fixture. The weather glass is plunged into a bucket of water, when the receptacle becomes partly filled, leaving air imprisoned. It is then hung in a cool place, when

[1] The Hewlett Motor-Car Emergency Case is supplied by C. J. Hewlett and Son, Ltd., 35-42, Charlotte Street, London, E.C. 2.

[2] The "Paroleine" Atomiser is supplied by Burroughs Wellcome and Co., Snow Hill Buildings, E.C. 1.

[3] The Dutch Weather Glass is supplied by F. Davidson and Co., Opticians, 143-149, Great Portland Street, W. 1.

the glass commences to function, water rising in the spout with the approach of bad weather and falling when fine weather approaches. This cleverly constructed contrivance will be of interest and service to weather prophets. (The price is 8s. 6d., or post free 9s. 6d.)

THE TARGET FOOT-WIPER is just the sort of hygienic appliance which doctors and others will welcome, and be glad to have available for the cleaning of dirty boots.[1] It is a neat, strong, artistic-looking boot-scraper with stiff material on the base for freeing the sole of the boot from accumulated mud, and with rows of bristles arranged at right angles for the cleaning of the sides of boots and shoes without scratching the uppers. There is also a steel scraper on one side. The wooden handle of the brush is finished in maroon cellulose. (The price is 5s.)

THE TARGET FOOT-WIPER.

THE DARTMOUTH PICNIC OUTFIT is a novelty which will appeal to all lovers of the open-air life, motorists, and others who travel for health and pleasure and in connection with sanatoria, open-air schools, educational wanderings, camps, and the like, only needs to be known and used to be greatly appreciated.[2] The set includes four folding chairs, which fit into a case, which itself forms when opened out a convenient table covered with blue rexine cloth. Each chair is of tubular metal construction enamelled blue, with seat and back of strong non-rot canvas. The outfit can also be supplied with stools without backs instead of chairs. The weight of the larger outfit is 20 lbs., and when folded up the case measures $22'' \times 15\frac{1}{2}'' \times 5''$, and opened out forms a table measuring $31'' \times 22''$. The smaller case has dimensions $21'' \times 12'' \times 4''$, and opened $24'' \times 21''$. Each case, neat in appearance, is handy for carrying, and is constructed of plywood, with the sides $\frac{1}{2}$-inch thick white wood. (The price of the larger outfit is 42s.; the smaller, 34s. 6d.)

"SUNREED" FURNITURE is ideal for the modern hygienic home and garden, and for use in hospitals, sanatoria, open-air schools, shelters and the like where adults and children are to be found living an open-air, anti-tuberculosis life.[3] "Sunreed" chairs and other equipment possess many special advantages and are superior to the customary forms of cane furniture. They are hand-built on strong ash frames with hard-wearing, durable, smooth, non-fraying reed, and can be obtained

[1] The Target Foot-Wiper is made by W. and F. Archer, Ltd., Brettenham Brush Works, Upper Edmonton, N. 18.

[2] The Dartmouth Picnic Outfit is supplied by the Dartmouth Manufacturing Company, Trinity Road, West Bromwich.

[3] An illustrated price-list of "Sunreed" furniture may be obtained on application to the makers, Horace Mills, Ltd., Farndon Road, Newark-on-Trent, and 19, Queen St., Glasgow.

in a series of attractive sun-proof colours. After thorough testing we specially commend the "Sunreed" furniture for both indoor and outdoor use. The chairs are hygienic, light, strong, and while artistic in form and appearance are exceptionally durable and very comfortable, and it may be added do not wear or tear clothes. The "Sunreed" furniture only requires to be used to be enthusiastically approved.

THE REDFERN RUBBER MATS are admirably suited for use in hospitals and sanatoria as well as in the ordinary hygienic home.[1] They are available in a number of choice coloured designs, and of various sizes and shapes. These mats, constructed of fluted rubber with bevelled edges, are very durable, and can be readily and effectively cleaned. For use where tuberculous cases are being cared for they are specially advantageous. (Prices range from 8s. 11d. to 10s. 9d.)

THE REDFERN "DOUBLE-R" HOT-WATER BOTTLE is a seamless, hygienic, durable receptacle not only for patients, but for all who desire a reliable, inexpensive and effective bed companion.[2] The stopper is fastened to the bottle by a chain, and so cannot be mislaid. This form of hot-water bottle, size 12 × 8 inches and of 3-quart capacity, is now available in colours, red, orange, and jazz. (The price of each is 4s. 9d.)

THE COOK'S NON-SCRATCHING MOTOR MOP will be approved by doctors and others who desire to keep their cars smart and in good condition.[3] It is a practical and helpful appliance designed and constructed to enable the operator to reach all parts, and to cleanse without injury to paint or varnish, and with a minimum of labour. (The price is 7s. 9d., post free.)

THE TOTUS-SECURUS FOUNTAIN PEN ranks among the most serviceable and reliable of present-day indispensable pocket companions.[4] It is a form which doctors will specially appreciate, for it is free from risks of leakage, can be easily filled, and provides for an even flow of ink. There is no awkward side lever, adjustment being carried out merely by unscrewing and screwing up the milled end of the pen. (The price is 25s.)

VITACREAM is a preparation which closely resembles dairy cream in appearance, taste, and physiological effects.[5] It can be added to tea or coffee, poured over fruit or porridge, and is of service in making soups and sauces. Vitacream is easily digested, and for delicate children, invalids, and tuberculous subjects it promises to be of real value. It is prepared from Grade A (T.T.) milk, the yolk of eggs, and highly refined nut oil. We have used Vitacream with much satisfaction. (The price of a 1-gallon tin is 10s. It is also supplied by dairymen in cartons at 9½d. and 5d.)

THE DARWIN SAFETY RAZOR BLADES are made to fit all types of safety razors.[6] They are constructed of patent cobalt high-speed steel

[1] The Redfern Rubber Goods are manufactured by Redfern's Rubber Works, Ltd., Hyde, Cheshire.

[2] The Redfern "Double-R" Hot-Water Bottle is manufactured at Redfern's Rubber Works, Ltd., Hyde, Cheshire.

[3] The Cook's Non-Scratching Motor Mop is supplied by Messrs. Cook's, Brush Specialists, 7, Davey Place, Norwich.

[4] A specimen of the Totus-Securus Pen will be sent on trial to any medical practitioner on application being made to Totus-Securus Limited, Chigwell, Essex.

[5] Vitacream is supplied by Vitacream (Sales) Limited, 155, Fenchurch Street, E.C. 3.

[6] The Darwin Safety Razor Blades are manufactured by Darwins, Limited, Fitzwilliam Works, Sheffield. London Offices, Eros House, 29-31, Regent Street, S.W. 1.

and thus an exceptionally high standard of cutting efficiency is secured. Three different types are now made. The polished edges of these blades are rustless, and thus oxidation is resisted and the cutting edge maintained. These blades only need to be used to be approved. (The price is 1s. 8d. for 5, all types.)

FEEN-A-MINT is a new chewing laxative which is finding much favour.[1] It is an ingeniously constructed tablet having a gum basis and possessing the taste of fresh mint. The active element is phenolphthalein, the presence of which is entirely masked and it is absorbed during the act of chewing. This mild, effective aperient is admirable for tuberculous subjects and other delicate patients, and will be of much service in the management of children and cases where gentle action without griping is desired. (The price of a package containing sixteen tablets is 1s. 3d.)

VERPINE is a new non-poisonous, inexpensive disinfectant possessing considerable germicidal powers.[2] Mixed with water it forms a milky-white emulsion having a pleasant pine aroma, and does not stain receptacles or fabrics. Verpine is now being extensively used as a spray for the deodorizing and purifying of public places, and it will undoubtedly be of service in connection with the hygienic management of sick rooms, hospitals, sanatoria, schools and other centres where tuberculous and other cases are being treated

MARMITE is a well-known dietetic preparation.[3] It is a highly concentrated, nourishing, palatable, easily assimilated vegetable food extract rich in vitamin B. For tuberculous subjects, especially children and young subjects, it offers many advantages. Marmite is extensively employed in the making of soups and gravies, and for the enrichment of sauces, savories and the like. "Marmite" cup is a palatable and effective stimulant appreciated by both sick and sound. For many tuberculous and delicate subjects it provides a welcome "nightcap." Marmite is an inexpensive preparation, and in many cases is to be preferred to expensive meat extracts.

SOLIGNUM is an ideal preservative for shelters, bungalows, sanatoria, open-air schools and the like, and also for garden chairs and other structures of wood exposed to weather conditions.[4] It possesses many advantages, being durable, antiseptic, insecticidal, and fungicidal, as well as being inexpensive. Moreover, it can be obtained in various colours and is easily applied.

BEMAX is a preparation which is of service not only in the restoration of health but also in its preservation. For consumptives and other tuberculous subjects, especially children and adolescents, this dietetic product is of considerable value. Bemax is the detoxicated embryo of certain cereals such as wheat or rye, and is rich in B vitamin content, which is present in constant and standardized quantity. It is said to

[1] Specimens of Feen-a-Mint may be obtained by any medical practitioner on application to Feen a-Mint Products, Ltd., Bush House, Aldwych, W.C. 2.

[2] Verpine is being supplied by the Verpine Company, 61, St. Mary Axe, E.C. 3, from whom specimens and particulars can be obtained on application.

[3] Particulars regarding Marmite and a booklet on Marmite Recipes can be obtained on application to the Marmite Food Extract Company, Ltd., Walsingham House, Seething Lane, E.C. 3.

[4] Full particulars regarding Solignum and other wood staining and preserving preparations can be obtained on application to Solignum Ltd., 205, Borough High Street, S.E. 1.

be four times as rich as yeast in B_1, twice as rich in B_2, and equal to yeast in B_3. It is particularly rich in vitamin E, and contains a trace of vitamin A. We learn that recent investigations carried out on Bemax farms showed that when the whole herd was tested, not a single animal fed on "Bemax" and cod-liver oil as an adjunct to their concentrates reacted to the tuberculin test. Bemax is supplied in convenient cartons which enable it to be kept in a suitable form for use at breakfast or at any other time.[1]

THE WHITELEY BREAKFAST AND READING TABLE is a serviceable equipment which will not only be popular in hospitals, sanatoria, and nursing homes, but should be available in every well-furnished house.[2] It is made of polished hardwood, and while light in weight is strong in construction. The legs fold up, and the book-rest can be adjusted at any desirable angle. When not in use the table can be conveniently stored without taking up valuable space. (The price is 12s. 6d.)

THE SNOWDEN NEWSPAPER TIDY AND BOOKCASE is an oak, polished, cleverly designed, effectively produced piece of furniture, 24 inches in height, 15 inches wide, and 5 inches deep, which, while an addition to any living room, is particularly suited to the requirements of an apartment occupied by an invalid.[3] This practical equipment will be much appreciated by patients in sanatoria and the like institutions, and will be of service in open-air schools, health bungalows, and open-air chalets, where books and papers have to be protected and kept in order. (Price 11s. 6d., carriage paid in Great Britain and Ireland.)

THE MONEL METAL HOSPITAL APPLIANCES are now available in a variety of forms to meet the requirements of institutions of all kinds, as well as for service in the ordinary private house.[4] They are economical, rust-proof, strong and durable, attractive in appearance, are unaffected by sterilizing, and will stand antiseptic solutions. Monel metal contains 67 per cent. nickel, 28 per cent. copper, and 5 per cent. other metals, and is solid, having no coating or plating to wear off. We would direct special attention to the Monel Sputum Cups, which are constructed after the Brompton pattern, and are in every way admirable for the collection of tuberculous and other forms of sputa.

SCHAEFER'S "IDEAL" SHOE-BAG is a practical novelty which only needs to be used to be appreciated.[5] It consists of a bag of cretonne or sateen divided into compartments, and is equipped with rings which enable it to be suspended in any suitable place. Shoes and other articles are placed in the pockets and so kept clean, protected, and in orderly array for immediate use. For travelling the whole case can be rolled up with its contents enclosed, and may be conveniently carried in a suitcase or other receptacle. The bag is available in three sizes. (The price ranges, according to material, from 8s. to 31s.)

[1] A sample of Bemax with full particulars will be sent to any medical adviser on application being made to Bemax Laboratories, 23, Upper Mall, London, W. 6.

[2] The Whiteley Breakfast and Reading Table is supplied by Whiteley's, Westbourne Grove and Queen's Road, W. 2.

[3] The Snowden Newspaper Tidy and Bookcase is manufactured by W. W. Snowden and Co., 54, Andrews Road, Cambridge Heath, E. 8.

[4] Full particulars regarding Monel Metal Equipment can be obtained on application to Monel-Weir Limited, Cathcart, Glasgow.

[5] The Schaefer "Ideal" Shoe-Bag can be obtained from Ernest Kern, 255, Philip Lane, West Green, N. 15.

"No-Fume" Ash Receiver is a hygienic novelty which both smokers and non-smokers should welcome.[1] It will certainly be appreciated by those who, in hospitals, sanatoria, and elsewhere, have to maintain a clean and sanitary condition in places used by smokers. The receptacle is constructed to receive the stub ends of cigarettes: those dropped into it are speedily extinguished and no smoke or smell escapes, and the ash cannot be blown about. The receiver can easily be opened for emptying and cleaning. It is fireproof, and no water and no chemicals are necessary. The "No-Fume" is available in various models and finishings. (The price ranges from 2s. 6d. to 12s. 6d.)

Wherever electric power is obtainable there electric lamps are required for effective lighting. And to doctors reliable illumination is indispensable. Among the various forms of electric lamps now available those bearing the name of Siemens are in the very forefront. For use in the doctor's consulting room, and for service in hospitals, sanatoria, nursing homes, and other institutions we would commend Siemens "Silvalux" Opal Gas-filled Electric Lamps.[2] They are made of special two-ply glass bulbs, having an inner lining of clear glass and an outer casing of pure opal glass, and thereby glare is avoided, eye strain prevented, and shadows eliminated. Moreover, dust does not readily collect on the smooth surface of the opal bulb. The Pearl Electric Lamp is another variety which medical practitioners will approve. The bulbs have the inside surface frosted, while the exterior surface is smooth. These vacuum gas-filled bulbs are of standard workmanship, and are constructed with spiralled filaments. The bulbs are not easily broken, being free from brittle qualities.

Palmolive Soap is a hygienic cleansing agent of the highest quality, and while excellent for general personal use, as a cosmetic preparation is of special service for all subjects with delicate skin, and particularly suitable for patients undergoing open-air treatment in sanatoria or elsewhere.[3] In the manufacture of Palmolive there are four chief ingredients—palm oil, olive oil, cocoanut oil, and a saponifying agent, and these materials are carefully selected and employed under strictly supervised and scientifically controlled conditions. There is no artificial colouring matter and no animal fats. The soap is as pure and mild as human ingenuity and skill can devise, and it is not only attractive in form, but possesses a pleasing fragrance. Each tablet is wrapped in a green crêpe wrapper, and surrounded by a black band bearing the distinctive designation in gold lettering. Reference must here be made to the Palmolive Shaving Cream which is rapidly taking a foremost place among the convenient creams which are displacing the old type of shaving soaps. The use of this preparation makes shaving a pleasure and insures speed, comfort, and hygiene, provides an abundant lather which speedily softens the beard and keeps the skin protected and in good condition.

[1] The "No-Fume" Ash Receiver is manufactured by No-Fume, Ltd., 6, Duke Street, Piccadilly, S.W. 1.

[2] Full particulars regarding all varieties of the Siemens Electric Lamps can be obtained on application to Siemens Electric Lamps and Supplies, Ltd., 38 and 39, Upper Thames Street, E.C. 4.

[3] Palmolive is manufactured by Colgate-Palmolive-Peet, Limited, Ranelagh Road, Grosvenor Road, S.W. 1.

THE OUTLOOK.

TUBERCULOSIS RESEARCH.

THE last Report of the Medical Research Council contains a section relating to tuberculosis.[1] There are two special committees dealing with tuberculosis research. Reference is made to the work of Dr. A. Stanley Griffith on lesions produced in man by bovine tubercle bacilli; Professor J. B. Buxton on the value of B.C.G. vaccine in immunizing cattle against tuberculosis; Dr. A. S. Griffith and Dr. L. J. Harris on the relation of diet to infection; Professor S. L. Cummins and Dr. S. B. H. Walker on laboratory methods for assessment of tuberculosis; Dr. S. Roodhouse Gloyne on methods for the detection of tuberculous infection in milk; and other suggestive investigations. There are paragraphs dealing with inquiries on bovine tuberculosis in Scotland. Information is presented respecting the Dorothy Temple Cross Research Fellowships in Tuberculosis.

Dr. A. Stanley Griffith's studies regarding the protection afforded by B.C.G. are of far-reaching interest.[2] The report forms No. 152 of the Special Report Series of the Medical Research Council, 38, Old Queen Street, Westminster, S.W. 1, and deals with experiments with monkeys made at Cambridge University Field Laboratories on behalf of the Committee upon the Bacteriology of Tuberculosis appointed by the Medical Research Council. On the chief points at issue the results are mainly negative. They show, however, that (1) the strain of B.C.G. used in the experiments can produce local lesions in the rhesus monkey, but these are always benign and do not lead to generalization; (2) B.C.G. given by the mouth can pass through the mucous membrane of the alimentary canal into the adjacent glands and also gain access to the blood stream; (3) vaccination with B.C.G., whether by feeding or by injection, has failed to give to monkeys the complete protection against tuberculosis reported by Wilbert, but in some instances may have produced a low grade of relative immunity. Calmette's method for the immunizing of young children, particularly those born of tuberculous parents or where there are risks of familiar infection, has been extensively tried in France and elsewhere, but in this country the administration of B.C.G. vaccine to children is still generally regarded as unjustifiable until indisputable confirmation of the validity of Calmette's claims has been obtained. Clearly there is still room for much research.

The Ministry of Health has issued an important study on bovine tuberculosis in man, dealing specially with the question of infection

[1] Committee of the Privy Council for Medical Research: Report of the Medical Research Council for the Year 1929-1930. Pp. 138. London: Publications Department National Institute for Medical Research, Hampstead, N.W. 3; and H.M. Stationery Office. 1931. Price 2s. 6d.

[2] "Studies of Protection against Tuberculosis: Results with B.C.G. Vaccine in Monkeys." By A. Stanley Griffith. Pp. 49. London: H.M. Stationery Office. 1931. Price 9d.

through milk.[1] It is a general survey regarding the incidence of tuberculosis in this country, the proportion due to bovine infection, the occurrence of tuberculosis in cattle, and the estimated percentage of milk from animals proving tuberculous. There is also consideration of available known methods which can be successfully adopted for mitigating or preventing the infection of consumers of milk containing active bovine tuberculous bacilli. Such a conspectus of information as is afforded by this publication will be of special service at the present time.

The Records of the International Conference on Silicosis held at Johannesburg, August, 1930, are now available in a weighty volume.[2] Reports of the proceedings of the thirteen sittings appear, with list of members and observers, taking up the first 103 pages; and then follow the thirty-two papers presented to the Conference. These include a number of important communications from British experts. Dr. L. G. Irvine, Dr. F. W. Simson, and Dr. A. S. Strachan are authors of a fine study on "The Clinical Pathology of Silicosis," which is illustrated by a series of excellent radiographs; Dr. E. L. Midalebon deals at length with "Silicosis in Great Britain": Dr. A. D. Pringle, Medical Superintendent of the Transvaal Miners' Phthisis Sanatorium, furnishes a practical paper on "Sanatorium Treatment of Miners' Phthisis Patients," with a series of tables giving practical data; Dr. A. M. Watt, Hon. Consulting Physician to the Johannesburg Hospital, presents "Personal Experiences of Miners' Phthisis on the Rand from 1903 to 1916"; Dr. L. G. Irvine, Chairman of the Miners' Phthisis Medical Bureau, explains "The Functions of the Miners' Phthisis Medical Bureau and the General System of Medical Examinations conducted under the Miners' Phthisis Act." Other articles of practical importance appear. The whole volume provides a complete exposition which no one interested in the silicosis question can afford to neglect. It is unfortunate that so important a reference work should have been published without an index.

The National Jewish Hospital at Denver renders a world-wide service by the periodical issue in volume form of the records of work from its Research Department. Vol. ix. contains a series of historical, pathological, and clinical studies relating to tuberculosis. Several are of exceptional interest and value.[3]

The American National Tuberculosis Association has issued a serviceable brochure consisting of statistical data relating to tuberculosis compiled by Miss J. S. Whitney.[4] While of special service to

[1] Reports on Public Health and Medical Subjects, No. 63: A Memorandum on Bovine Tuberculosis in Man, with Special Reference to Infection by Milk. Pp. 25. London: H.M. Stationery Office. 1931. Price 6d.

[2] "Silicosis: Records of the International Conference held at Johannesburg, August 13-27, 1930." Issued from the International Labour Office in Studies and Reports. Series F, Industrial Hygiene, No. 13. Pp. 692. London: For the International Labour Office (League of Nations, Geneva), P. S. King and Son, Ltd., Orchard House, 14, Great Smith Street, Westminster, S.W. 1. 1930. Price 16s. or $4.

[3] "Contributions to the Study of Tuberculosis." By Research Department of the National Jewish Hospital at Denver. Vol. ix., 1928-1929. Denver, Colorado, U.S.A.: Research Department, 3,800, East Colfax Avenue. 1930.

[4] "Facts and Figures about Tuberculosis." Compiled by Jessamine S. Whitney, Statistician National Tuberculosis Association. Pp. 63. New York: National Tuberculosis Association, 370, Seventh Avenue. 1931. Price, paper, $0.75; flexible fabrikoid, $1.00.

tuberculosis workers in the United States, it will be found helpful to medical officers of health, tuberculosis officers, and others in this country and elsewhere. The data are effectively arranged in chapters under such headings as sex and age, colour, nationality, occupation, geographical distribution, relation to other diseases, tuberculous infection, forms of tuberculosis organization, sanatoria, clinic facilities, nursing service and financial support for anti-tuberculosis work. The series of excellent charts add to the value of the publication.

NOTES AND RECORDS.

The Tomarkin Foundation Incorporated, New York, U.S.A., with its European Branch at Locarno in Switzerland, held its Second International Medical Course in Locarno, April 14-28, at which many tuberculosis experts were present. Under the auspices of the Foundation, investigations with "Catalysan" are being carried on in a number of centres. This agent is prepared in accordance with the following steps: The tubercle bacillus of Koch is cultivated at long periods of incubation, submitted to different culture media, at a determined concentration, and at a definite temperature. After about one month of germination at 38° C., the culture medium is covered by a white crust of the bacillus. The liquid medium is then separated from the micro-organism by repeated filtrations and concentrated *in vacuo*. Chemical treatment follows with mineral salts that produces an unstable menstruum, with the elements in a state of reversible action. Electrolytic dissociation of this unstable residue occurs. The solution is then dialyzed through specially prepared parchment and precipitated with subsequent solution in distilled water, followed by electrolysis and further flocculation and dialysis—a process of fractionalization. A final concentration *in vacuo* of the solution is then made with the residue in the dialyzer, and it is desiccated at 37° C. into an amorphous powder, the final product. "Catalysan" is an amorphous powder of brownish yellow colour, easily soluble in distilled water at ordinary temperature, forming a clear, slightly opalescent solution and neutral in reaction. It is insoluble in alcohol and ether, but is decomposed at 50° C., losing its antitoxic properties and forming a precipitate. Ultra-violet rays present in sunlight will decompose the crystal-clear solution, which then becomes turgid. The substance isolated is an albumose. The behaviour of this albumose in experimental infection by mice or guinea-pigs has proved to exert a certain amount of protective properties against the development of tuberculosis in quantitatively infected animals with tuberculosis bacilli. The Catalysan is under continuous control at the Hygienic Bacteriological Institute of the University of Berne (Director, Professor Dr. Sobernheim), where the toxity is tested in normal and tuberculous guinea-pigs. The activity is controlled by Professor W. Weichardt of Wiesbaden. Catalysan can now be obtained on application to Messrs. Coates and Cooper, 41, Great Tower Street, E.C. 3.

Dr. Peter W. Edwards, medical superintendent of the Cheshire Joint Sanatorium, near Market Drayton, Salop, is prepared to give a series of short intensive post-graduate courses of a practical nature on modern methods of therapy in tuberculosis of the respiratory system,

with special reference to collapse therapy. In Dr. Edwards' sanatorium there is abundant material for the full demonstration of A.P.T. and allied procedures, as about 150 refills are done each week. Methods of sanatorium administration will also be demonstrated. No class will exceed six members in number, and may be less. Suitable arrangements for board and residence can be made within a convenient distance of the sanatorium. The difficulty experienced by many full-time medical officers in finding time to get away to post graduate courses is recognized, and every effort will be made to meet the convenience of intending members. Each course will be an intensive one, and need not exceed three days if longer time cannot be spared. Details regarding expenses, etc., will be sent on application being made to Dr. William Brand, Hon. Secretary for Post-graduate Courses of the Joint Tuberculosis Council, 8, Highway Court, Beaconsfield, Bucks.

A post-graduate course on tuberculosis has been arranged by the Joint Tuberculosis Council to take place in Lancashire. The course will commence on Monday, October 19, and will end on Saturday, October 24. Particulars can be obtained on application to Dr. Brand, Hon. Secretary, 8, Highway Court, Beaconsfield, Bucks.

An International Tuberculosis Congress will be held at Davos, October 5-10, when communications will be presented by a number of British experts. English medical advisers desiring to attend may obtain particulars on application to Dr. Bernard Hudson, the Victoria Sanatorium, Davos-Platz, Grisons, Switzerland.

The second Congrès International de la Lumière will be held in Copenhagen, August 15-18, 1932. Particulars may be obtained from Finseninstitutet, Strandboulevarden, Copenhagen, Denmark.

The State of Connecticut has issued as Public Document No. 53 a "Report of the State Tuberculosis Committee" containing illustrations, statistics, and records of work carried on under State direction and control.

We have received vols. lxxvi. to lxxviii. of "Studies from the Rockefeller Institute," York Avenue and 66th Street, New York, composed of reprints of communications embodying the results of original researches and conveniently grouped under departments of laboratories, hospital, and animal pathology. Vol. lxxvii. contains an informing paper by Dr. C. A. Doan on "The Newer Aids to Diagnosis and Prognosis in Tuberculosis," and "Studies on Tuberculosis," by Drs. F. R. Sabin, C. A. Doan, and G. E. Forkner. Vol. lxxviii. contains a valuable communication by Drs. C. A. Doan and Dorothea M. Moore on "The Theory of the Mechanism underlying the Phosphatide Precipitin Test in Tuberculosis, with a Study of Two B.C.G. Vaccinated Children."

King Edward VII. Sanatorium, Midhurst, has issued its 24th Annual Report, giving particulars of 292 patients admitted during the year July, 1929, to July, 1930. There are analytical tables regarding the 207 cases discharged during the same period, together with special reports from the various departments, and tables giving ultimate results of cases since 1908.

The Institute of Ray Therapy, 152, Camden Road, N.W. 1, has issued its first Annual Report, indicating that 1,450 patients have been dealt with during 1930, the total number of attendances being 40,505.

The Health and Cleanliness Council, the Secretary of which is Miss Norah March, B.Sc., with headquarters at 5, Tavistock Square, are

publishing a fine series of posters and other material suitable for health propaganda. The Council have recently issued an instructive booklet for men, "Cleanliness Pays," by the late Sir Andrew Balfour.

The Ministry of Health has just issued a revised and up-to-date List of Sanatoria and other Residential Institutions approved by the Minister of Health for the treatment of persons suffering from Tuberculosis and resident in England and Wales, with the names of the Administrative Counties and County Boroughs in which the institutions are situate. (Price 4d.)

We have received from Dr. Stephen J. Maher, of New Haven, Connecticut, U.S.A., an instructive publication. The State of Connecticut have issued from Hartford as Public Document No. 53, an "Illustrated Report of the State Tuberculosis Commission," which furnishes a suggestive and informing account of tuberculosis work in Connecticut under the direction of the State's Tuberculosis Commission.

The Great Western Railway are far-seeing and wise in issuing in attractive and well-illustrated form various publications relating to health and holiday centres on the Great Western system. These are of service to doctors and others who have to advise in regard to the selection of health resorts. "Pembrokeshire and South-West Wales," by A. G. Bradley (price 6d.), is one of the latest booklets of the series. It is a 60-page brochure, admirably produced and furnished with maps, photographs and other illustrations.

The Holiday Caravan Company, Ltd., Cumnor, Oxford, has issued a charming illustrated booklet, "Caravanning," which is now in its third edition. Everyone desiring an ideal holiday should study this instructive publication.

Car Trailers, Ltd., High Street, Harpenden, Herts, supply on hire at reasonable rates excellent car trailers, with tent and all necessary equipment.

Montana Médical: Journal Trimestriel de Tuberculose, edited by Drs. Théodore and Jacques Stephani of Montana, is a new periodical containing records of the proceedings of the Medical Society of Montana, communications by the editors and other original articles. It is published by Payot et Cie, Rue de Bourg, Lausanne, Suisse. (Annual subscription within the Postal Union, fr. 8; single number, fr. 2.)

The British Journal of Actinotherapy and Physiotherapy, with the first number of vol. vi., has adopted the title of *The British Journal of Physical Medicine*. The editors are Dr. R. King-Brown and Mr. B. D. H. Walters. The journal is issued monthly by the Actinic Press, Ltd., 17, Featherstone Buildings, W.C. 1. (Annual subscription, £1 1s.)

Better Health, the official Journal of the Central Council for Health Education of the Society of Medical Officers of Health, in its August issue presents a suggestive illustrated article by Dr. E. H. Walker on Open-Air Holiday Schools.